THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
May 16, 1988 · Vol. XXII · No. 20 · 142 Pages · $2/Copy · $44/Year

COMPUTERWORLD

INSIDE

Executive Report — MIS goes to class. Page 61.

In Depth — Money-making ways to use voice recognition and synthesis. Page 71.

A VDT safety bill nears approval in Suffolk County, N.Y., and may supply an example for other parts of the nation. Page 4.

Prime plans to lay off 700 as a work force adjustment after Computervision acquisition. Page 14.

AT&T, MCI resume trading blows with AT&T's latest special rate request. Page 10.

Modern Jazz hits sour note and is delayed indefinitely; meanwhile, Lotus offers utility to eliminate copy protection from existing 1-2-3 versions, the last refuge of the micro software practice. Page 5.

It's inevitable! That's the tag hung on OS/2 at Comdex. Conference coverage on pages 6 and 8.

Floating Point lays off 20% of its work force as losses continue. Page 91.

DEC provides a real-time accelerator for its BI bus systems. Page 15.

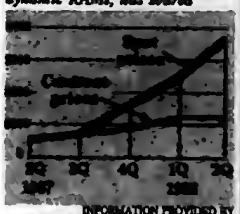
Khanna resigns as American Express MIS restructures, jumps to Manufacturers Hanover. Page 2.

RAM chip drought taking toll

BY JAMES A. MARTIN
CW STAFF

ATLANTA — Hewlett-Packard Co. had planned to introduce a desktop Vectra based on the Intel Corp. 80386 chip at Comdex/Spring '88. But the unveiling was postponed indefinitely because of an ongoing concern in the otherwise booming microcomputer industry — the drought in dynamic random-access memory chips.

A bit steep
The price of 1M byte of memory, based on top prices for 256K-bit dynamic RAMs, has soared



INFORMATION PROVIDED BY DONALDSON, LUFKIN & JENRETTE, INC.
CW CHART

"We found that we had to use all the dynamic RAMs we could get for our existing products and, as a result, had to hold off on bringing out new ones," explained Michael Fournell, an HP spokesman.

HP is not alone. Apple Computer, Inc. has postponed a rollout of an updated Macintosh SE because of the shortage (see story page 6). Also, Wyse Technology announced that its microcomputer prices must rise 6% to keep up with increased dynamic RAM costs caused by supply-and-demand imbalances.

In addition, end users will likely be affected by the current chip pinch. With the advent of Microsoft Corp. and IBM's OS/2

Continued on page 6

Unix rebellion leaves users cold

BY ROSEMARY HAMILTON
CW STAFF

When the latest in a series of Unix controversies broke last week, users expressed the following sentiment to their vendors: Knock it off.

The MIS executives were irritated by reports that a group of rebel Unix vendors, including IBM, Digital Equipment Corp., Hewlett-Packard Co. and Apollo Computer, Inc., will announce an alternative to the AT&T-developed operating system this week.

The vendors would neither confirm nor deny that they are involved in such a project. Industry observers said they will present their alternative Tuesday.

Get closer to Posix

Users reacted strongly, suggesting that the vendor rivalries have hurt the market by confusing and distorting the issues. Users said the key issue is for vendors to move toward the emerging IEEE Posix standards, a set of specifications for Unix expected to be released within a month. The other activities — including who controls Unix and who will offer alternatives — are superfluous, users said.

Many Unix vendors, including those fingered as the rebels, said they intend to support Posix.

"When vendors are in this mode — let's call it negotiations — large users like ourselves can have influence," said Jeffrey Alperin, assistant vice-president of corporate technology planning at Aetna Life and Casualty Co.

"If they say 'To hell with AT&T,' then I'm very opposed. I want one standard. We will, in the future, specify standards for our procurement. We vote with our pocketbooks."

Similarly, a General Motors Corp. representative said his company is concerned more with the Posix standard than with the vendors fighting for control. "Posix is where we're headed," said John Williams, a senior manufacturing project engineer at GM and chief of the company's Unix Task Force. "I don't care if they are fighting. We will have our specs, and if they are not going to comply, that's fine."

Williams and other users said they see little gain in establishing an alternative to Unix.

Continued on page 121

Fire KOs Chicago networks

Blackened phone lines bring businesses down

BY JEAN S. BOZMAN
CW STAFF

HINSDALE, Ill. — It began on a Sunday afternoon as a small electrical fire in an unattended Illinois Bell central telephone office and switching station in this Chicago suburb. But the fire, which blazed out of control for an hour May 8 — and was not put out for another five — started a chain reaction of telephone and computer breakdowns that crippled telecommunications throughout northern Illinois last week.

Once the smoke had cleared, salvage workers discovered that 35,000 local telephone lines were out of service and 118,000 long-distance fiber circuits had been destroyed. Another 13,000 special circuits, most of them carrying computer-to-computer connections, were also destroyed.

As phone lines went dead, so did terminals tied to computers in business sections throughout the western Chicago suburbs. Hundreds of automated teller

Continued on page 121

RITE OF SPRING

Dear diary: A job-seeker's journal

Vivienne Arnold, a second-year MBA candidate at New York University's Graduate School of Business Administration, is looking for a job in MIS. One of the top students in her class, Arnold, 23, has already worked for two years as a programmer/analyst. As she finishes her graduate work, Arnold has jumped into the frenetic world of job hunting, an experience she recorded in a diary for Computerworld.

Of all my first-round interviews, I remember the one with the utility company as the worst.

Upon arriving, I was given a form to fill out. Although I was applying for a management position in MIS, the form included the question, "Can you climb poles?" I got the feeling that this wasn't the place for me.

The question is, Where is that perfect place? How can I get through this lineup of interviews not only impressing the recruiters but finding the job I want? The process is long and sometimes grueling. With a calendar already jammed with classes, my part-time job and schoolwork, fitting in interviews is tough. Often, instead of studying, I have headed to the Career Resource desk to get the annual reports of companies with which I planned to interview.

My own recruiting experience has been somewhat unusual. I already had a bachelor's degree in computer science from Queens College of the City University of New York, and I thought an MBA in MIS would help round out my knowledge, expanding it beyond machines and languages

Continued on page 120

NEWSPAPER
**********5-DIGIT 48106
CW 06976523 283010911F71
UNIVERSITY MICROFILMS INT DIR
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

SECOND CLASS

IN THIS ISSUE

New galaxy. Comdex stars included Network Innovations, which showed a pair of diskless workstations; Alpha Software, which demonstrated a program that accepts Dbase III and 1-2-3 formats; and 10Net's 10Net Plus operating system upgrade. Page 6.
Blast-off. Novell enters the next generation with Advanced Netware 2.11 with built-in OS/2 support, slated to ship next week, and promises of an upgraded OS/2 Developers Toolkit. Page 8.

NEWS

4 MAP 3.0 support promised within six months.

4 Maxtor, Sony hurdle erasable optical storage products wall.

4 VDT worker-safety law clears county legislature.

5 Modern Jazz meets with trouble on way to market.

5 Lotus strips copy protection from 1-2-3.

6 OS/2 applications vendors cover Comdex floor.

6 Mac SE upgrade delayed.

8 Comdex notebook: All the news that's fit to print.

8 AT&T's Starlan 10 is here — but is it too late?

8 Compaq 386/20, Hypercard named tops by *Computerworld* readers.

10 AT&T ready to fight MCI pricing tactics.

10 FCC fleshes out proposal for price caps regulation.

14 Prime drops the ax on redundant employees.

14 TI claims laptop is first plug-compatible with DEC VT220.

15 DEC introduces real-time accelerator, three Microvax 3000-based systems.

15 Compaq, DEC sign technology exchange and support agreement.

SOFTWARE & SERVICES

25 DEC, Atherton join to forge CASE integration standard.

25 Cincom works to tie its DBMS to Fujitsu environment.

MICROCOMPUTING

31 For IBM, OS/2 Extended is where SAA, distributed data base begin.

31 Discontinuation of IBM 3270 PC line doesn't rattle users.

31 Micropro's flagship Wordstar may not be enough to keep firm afloat.

MIS learns how to learn. Page 61.

NETWORKING

47 X.25 private packet-switching alive and kicking.

47 CSI file-access package lets Unix-based workstations support IBM's DDM.

47 Pacific Bell ready to offer central office-based LAN.

SYSTEMS & PERIPHERALS

55 Maimonides Medical Center picks optical system to alleviate paper pileup.

55 Mips Computers targets commercial market with multiuser system.

55 DG unveils 16-bit desktop computer.

MANAGEMENT

85 CDC users group helps guide sites through CDC strategy shift.

85 Gaughan structures MIS to meet Primerica's needs.

85 APC's Seaton honored for leadership.

Quotable

"If they say 'To hell with AT&T,' then I'm very opposed. I want one standard. We will, in the future, specify standards for our procurement. We vote with our pocketbooks."

JEFFREY ALPERIN
AETNA LIFE AND CASUALTY CO.

See story page 1.

COMPUTER INDUSTRY

91 Floating Point counters rising costs with layoffs.

91 Sprinsen returns to Relational Technology.

91 European DEC unit zooms in on competitors' weaknesses.

91 Software 2000 banks on Silverlake success.

COMPUTER CAREERS

102 Universities draw MIS professionals into fold.

TRENDS

122 Mainframe MIPS increasing as number of mainframes decrease.

EXECUTIVE REPORT

61 Everyone agrees that MIS education is critical, but is anybody doing anything about it? By Glenn Rifkin.

IN DEPTH

71 Users earn one- to two-year paybacks on voice technology. By Daniel Lalonde and A. Duane Donnelly.

81 A precise metric for software maintenance. By Mark Duncan.

OPINION & ANALYSIS

19 Lecht votes for computerizing the electoral process.

25 Babcock follows DB2's giant step forward.

31 Barney wanders into Lotus's secret garden.

47 Keefe navigates way to EDI implementation.

55 Gibson wonders if desk top will flatten DEC.

85 Connolly charges strategic systems with personality.

91 Wilder reports from the Unix battleground.

DEPARTMENTS

18 Editorial

86 Calendar

113 Marketplace

122 Inside Lines

Khanna joins CIT

Former American Express exec 'seeks challenge'

BY GLENN RIFKIN
CW STAFF

Kailash Khanna, vice-president of corporate systems and technology at American Express Co. since 1979, has resigned to take on the chief information officer role at Manufacturers Hanover Trust Co. subsidiary The CIT Group, Inc. in Livingston, N.J.

Khanna's departure from American Express, at which he oversaw a huge worldwide information systems operation, was amicable, according to both Khanna and John Laird, American Express senior vice-president and treasurer. Laird said Khanna's position will not be filled.

Observers said American Express is in the midst of a major restructuring of its MIS headquarters operation, a decentralization process that involves giving increasingly more responsibility to the company's individual business units. Khanna said he decided it was time to seek a new challenge.

The power of computers

According to First Boston Corp. analyst Dave Seifer, the restructuring of MIS at American Express reflects increasing pressure on computer services within the company. The data and servicing needs are probably four or five times what they were five years ago, Seifer said, and billings have increased 17% in the past few years as well.

"Simply the size of the problem could be leading to decentralization," Seifer said. "In terms of hardware and software related to the travel and financial services areas, they are way ahead of the competition, but they keep adding new services, such as insurance and warranties, which create additional pressure. . . . So decentralizing makes a lot of sense."

Prior to the decision to decentralize, Khanna coordinated 16 information processing centers,

CIT's Khanna

10 worldwide data and time-sharing networks, more than 85 mainframe systems and more than 400 minicomputer systems supporting 30,000 terminals. American Express is a $17.8 billion company with 85,000 employees worldwide.

Khanna will join CIT, an asset-based financial company with $9 billion in assets and 2,600 employees nationwide. It was acquired by Manufacturers Hanover more than three years ago as a wholly owned subsidiary. Khanna will be responsible for all systems and technology for the CIT group and its business units.

Khanna spent a total of 15 years with Trans World Airlines and American Airlines in a variety of systems and operations research positions prior to joining American Express nine years ago. He said the decision to leave American Express was "wrenching, but this opportunity was too excellent to pass up."

Lottery ware hits jackpot of problems

BY ALAN J. RYAN
CW STAFF

HARTFORD, Conn. — What started out as a smooth transition to its new computer system on Sunday, May 8, turned out to be a jackpot of problems for the Connecticut State Lottery.

The on-line lottery system under contract with General Instrument Corp. in Hunt Valley, Md., was found to have two serious software problems as well as troubles with the reliability of some of its terminals last week.

The problems came to a head when two Hartford businessmen discovered they had a faulty terminal. When they tried to play numbers for a Tuesday drawing after the Monday drawing had taken place, the terminal recorded the transactions as Monday sales, and the men found they were able to buy tickets that had already been picked as winners.

Tuesday, the men, Gilberto Pardo and Jose Rodriguez, went to the lottery office to cash their winning tickets. They then turned their winnings over to lottery officials to alert them to the problem.

The system was shut down after the Tuesday drawing at 8:05 p.m. and was not on-line again at 7 p.m. Wednesday. General Instruments was called in and diagnosed and corrected the faulty software, according to Connecticut State Lottery chief J. Blaine Lewis Jr.

SYNCSORT: 47+
DFSORT: 1+

The Fortune 50 — April 1988*

1. General Motors
2. Exxon
3. Ford Motor
4. IBM
5. Mobil
6. General Electric
7. Texaco
8. AT&T
9. E.I. DuPont
10. Chrysler
11. Chevron
12. Philip Morris
13. Shell Oil
14. Amoco
15. United Technologies
16. Occidental Petroleum
17. Procter & Gamble
18. Atlantic Richfield
19. RJR Nabisco
20. Boeing
21. Tenneco
22. BP America
23. USX
24. Dow Chemical
25. Eastman Kodak
26. McDonnell Douglas
27. Rockwell International
28. Allied-Signal
29. Pepsico
30. Lockheed
31. Kraft
32. Phillips Petroleum
33. Westinghouse Electric
34. Xerox
35. Goodyear Tire
36. Unisys
37. 3M
38. Digital Equipment
39. General Dynamics
40. Sara Lee
41. Conagra
42. Beatrice
43. Sun
44. Georgia-Pacific
45. ITT
46. Unocal
47. Anheuser-Busch
48. Caterpillar
49. Hewlett-Packard
50. Johnson & Johnson

*As published by Fortune Magazine

THE BIGGEST USE THE BEST.

Find out why.

Experience SyncSort's performance on your own system with your own benchmark.

To arrange for a benchmark of SyncSort's **New Release (3.2)** on your system, call us at **(201) 930-8200.**

syncsort INC.

© 1988 Syncsort Incorporated, 50 Tice Boulevard, Woodcliff Lake, NJ 07675.

Trio vows erasable CDs on the way

BY J. A. SAVAGE
CW STAFF

A technological milepost that has always seemed to be just out of reach may finally be passed this fall when two Japanese companies make erasable optical storage products commercially available.

Last week, Maxtor Corp. announced 5¼- and 3½-in. erasable optical systems with an average 30- and 100-msec seek time, respectively. Write-once read-many optical disks average between 100 and 200 msec.

Sony Corp. has not formally announced its 5¼-in. product but has scheduled shipment of samples to beta-test sites this month. Information distributed to OEMs says average seek time is "less than 90 msec."

Tandy goes public

Last month, Tandy Corp. announced it had developed low-cost erasable compact disk technology that will be made available initially for audio products; a data storage device is not likely until 1991.

Analysts have some reservations about Maxtor's ability to actually produce the sensitive components — the media and heads — on time, but there is confidence in the product. With Sony's entry, analysts said it is more a matter of speeding up its average seek time.

Maxtor's drive has "reportedly the fastest performance in optical drives available," said analyst Bob Katzive at Mountain View, Calif.-based Disk/Trend, Inc. "If they can get into production without hiccups, they will have a good market. If not, it allows an opportunity for other companies to play catch-up," Katzive said.

Sony's 5¼-in. erasable drive, called the SMO-D501, has been out in engineering samples for OEM evaluation since January 1987 and is expected to debut by the fall. While the speed of the optical storage disks allow for rapid retrieval, "the real difference will be in graphics [imaging] use," said Ken Hallam, president of ENDL Associates in San Juan Capistrano, Calif., a consulting firm that specializes in optical storage.

Maxtor was able to reach faster seek times by modifying the algorithms used in Winchester drives, said Gordon Knight, director of Maxtor's optical programs.

One of the reasons the company was able to bring a product to market in such a short time is its incorporation of magneto-optical material, a medium that has been available for a few years combining the erasability of magnetic devices and the capacity of optical.

Tandy's product, however, is delayed far into the future because the company is still developing a polymer material.

"This is not a breakthrough technology," Hallam said. The breakthrough, be explained, will be in transferring the technology to production. "It's switching from the Ph.D.s in white smocks over to the manufacturing guys."

The same magneto-optical material is incorporated in Sony's disks.

A glass substrate will be offered by Maxtor in addition to plastic, apparently aimed at the military market, in which easy destruction of sensitive information is a key concern. "Glass can be destroyed quickly," Hallam said. "You have to do a lot to [destroy] plastic."

In single end-user pricing, Maxtor's 5¼-in. product, dubbed Tahiti, will cost $5,995 for the drive and $250 for the disks. Maxtor's 3½-in. model, known as Fiji, is priced at $1,995 for the drive and $85 for the disk. Sony declined to provide any pricing information.

Lighting up

Erasable optical storage is about to become a commercial reality

Tandy	Laser	5¼ in.	[illegible]	$1,000¹	May 1991
Maxtor Tahiti	Magneto-optic	5¼ in.	650M	$5,995	October 1988
Fiji	Magneto-optic	3½ in.	160M	$1,995	October 1988
Sony	Magneto-optic	5¼ in.	650M	NA²	September/ October 1988

¹ Estimated
² Not available

CW CHART

MAP support in pipeline

BY JEAN S. BOZMAN
CW STAFF

SEATTLE — The large corporate users that pushed the MAP standard — General Motors Corp., The Boeing Co. and Deere & Co. — were rewarded last week with the promise of Manufacturing Automation Protocol 3.0 support in at least some vendors' products within six months of the Enterprise Networking Event (ENE), to be held next month in Baltimore.

That promise was delivered last week by Michael Canepa, director of distributed systems marketing at Honeywell Bull, Inc., during a national videoconference linking Seattle, San Francisco, Washington, D.C., and Moline, Ill., site of Deere's headquarters.

"We expect to be installing MAP 3.0 products in the late fall," said Canepa, who represented ENE computer vendors at the MAP/TOP Users Group videoconference. The MAP/TOP group is sponsoring ENE to focus on strategies for enterprisewide reporting, with an emphasis on the state of the art of MAP.

Canepa said be could not speak directly for other ENE vendors, such as Digital Equipment Corp., IBM and AT&T, but added: "Some of the vendors would like to tweak their MAP 3.0 products some more, because they haven't reached their top levels of performance." Still, be predicted that MAP 3.0 products will be widely available by the end of the year.

The MAP 3.0 standard, which became stable in April 1987, will be frozen for six years so that vendors can standardize on it, according to Mike Kaminski, manager of GM's MAP program. But Kaminski did not rule out changes or extensions to MAP 3.0. "We did not say that we would prevent upward and downward compatibility features from being added to it."

VDT safety bill clears first hurdle

BY JAMES CONNOLLY
CW STAFF

HAUPPAUGE, N.Y. — A bill that could break ground as the nation's first VDT worker-safety law cleared the Suffolk County Legislature here last week.

Supporters of the bill, which was opposed by businesses operating in this eastern N.Y. county, claimed the legislation could serve as a model for municipalities and states throughout the U.S. The bill will become law if it is signed by Suffolk County Executive Patrick G. Halpin, who has supported VDT safety proposals in the past.

The proposal calls for private businesses with 20 or more terminals to provide ergonomic furniture, special lighting, detachable keyboards and eye care for workers who spend more than 26 hours per week using a VDT.

"I think it's an excellent first step. There are a few other things we would like to see in it, but I think it is an excellent place to begin," said Sharon Danann, research director for Cleveland-based 9-to-5, the National Association of Working Women.

But Mitchell Pally, director of legislative and economic affairs for the business organization known as the Long Island Association, said his group opposed the bill as being "antibusiness." He said it is inflexible because it requires use of what is now considered ergonomic equipment in favor of what might be better equipment that could be introduced at any time. He had proposed a business-sponsored educational program as an alternative.

Assumed guilt?

Pally added, "No connection had to be shown between the use of VDTs and the need for eye exams or glasses. It assumes that if someone needs an eye exam or glasses, that it is because they work on a VDT." He also said the law could cause labor problems for companies that are unable to give exempt workers — those using VDTs for less than 26 hours — the same benefits as those covered by the law.

Danann said her organization would have liked to have seen the law include protection of jobs or transfers for workers with proven VDT-type injuries or strains in addition to transfer protection for pregnant workers.

The bill was sponsored by legislator John J. Foley. A spokesman for Foley said the ergonomic portion of the law could take effect Jan. 1, 1990, with eye care and educational portions becoming effective 60 days after the law is enacted.

The bill calls for use of adjustable chairs and antiglare shields for VDT screens and parabolic louvers or polarizing filters for overhead lights. The eye care provision requires employers to cover 80% of the cost of an employee's annual eye examination and any necessary corrective lenses and frames. The legislation includes a provision that the standards be reviewed every two years.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin

News Editor
Peter Bartolik

Senior Editors
James Connolly, Management
Clinton Wilder, Industry
Elisabeth Horwitt, Networking
Charles Babcock, Software
Patricia Keefe, Networking
Ed Scannell, Microcomputing
Douglas Barney, Microcomputing
Stanley Gibson, Systems

Senior Writers
Rosemary Hamilton
Neil Margolis
Alan J. Ryan

Staff Writer
James Daly

New Products Writer
Sally Cusack

Features Editor
George Harrar

Senior Editors
Glenn Rifkin
Janet Fiderio, Executive Report
Joanne Kelleher, Spotlight
Amy Sommerfield Flore, In Depth

Special Projects Editor
Michael L. Sullivan-Trainor

Senior Writer
David A. Ludlum

Associate Editors
Deborah Fickling
Kelly Shea

Researcher
Bonnie MacKell

Managing Editor
Donovan White

Chief Copy Editor
Patricia Hael Erickson

Assistant Chief Copy Editor
Steven M. Ulfelder

Copy Editors
Mary Grover
Martha E. Rich
Sharon Baker
Marie T. Burke
Cathleen A. Duffy
Richard E. Pastore

Design Editor
Marjorie Magowan

Graphics Specialists
Frank C. O'Connell
Amy J. Swanson

Graphics Researcher
Laura O'Connell

Graphic Designer
P. Charles Ladsonar

Assistant to the Editor in Chief
Theresa Gallant
Editorial Assistants
Patricia Flaherty
Linda Gorgone
Lorraine Witzell

Rights and Permissions Manager
Nancy Shannon

News Bureaus
Mid-Atlantic
201/987-1350

Alan Alper, Correspondent

Washington, D.C.
202/347-6718

Mitch Betts, Correspondent

West Coast
415/347-0555

Kathy Chin Leong, Bureau Chief
Julie Pitta, Senior Correspondent
James A. Martin, Correspondent
Stephen Jones, Correspondent
J.A. Savage, Correspondent
Mary Ellston, Editorial Assistant

Midwest
312/827-4433

Jean S. Bozman, Correspondent

IDG News Service
Kathleen A. Gow, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
617/879-0700

Modern Jazz delayed again

Holdup threatens Lotus's re-entry into Mac market

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — The development delays that have plagued a number of Lotus Development Corp. products now threaten the firm's re-entry into the Macintosh market. The latest casualty is Modern Jazz, which had been scheduled to ship later this month.

Modern Jazz, the successor to the firm's earlier Jazz integrated package, which hit a sour note with customers, has been beset by a series of delays. It was announced in March 1987 and was originally scheduled to ship last summer. The holdups have hurt Lotus's efforts to gain market share in the Apple Computer, Inc. Macintosh arena, which is dominated by Microsoft Corp.'s Excel.

Recently, the Modern Jazz project received a stern review from Frank King, senior vice-president of Lotus's Software Products Group. As a result, a number of bugs were detected, and Lotus decided to postpone shipment.

The firm has not yet decided on a revised schedule, Lotus spokeswoman Pam Cay said.

The original Jazz package was overshadowed by Excel, which included macros allowing for automation of commonly used procedures.

List of characteristics

Modern Jazz is supposed to feature its own macro language, a faster spreadsheet and an added-forms module. In addition, spreadsheets will be linked, a feature also planned for Lotus's 1-2-3 Release 3.0 for the IBM Personal Computer.

The product's communications module will reportedly also be able to directly import both 1-2-3 and Symphony files, avoiding the file translation required for the existing version of Jazz.

According to one user, there is not a lot of pent-up demand for Modern Jazz, even from current Jazz users. "I haven't seen any requests," said C. Thomas Hendrix, manager of information services at Aluminum Company of America.

That nonchalance may change if Modern Jazz lives up to Lotus's promises, as many users say they will at least give the product a shot.

"We will take a look at Modern Jazz, but it will have to have a 2-to-1 price/performance advantage over Excel," said Tim Turnpaugh, executive vice-president and manager of the operations group at Seafirst Corp.

Seafirst opted for Excel over Jazz because of Excel's macros, price, graphics, keystroke recorder and intelligent recalculation capability, Turnpaugh said.

Lotus removes 1-2-3 protection

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — The last major vestige of software copy protection vanished last week when Lotus Development Corp. announced a utility disk that will remove the dreaded protection from its popular 1-2-3 spreadsheet.

In addition to stripping protection, Lotus has tossed in utilities that speed calculations, record macros and provide support for Adobe Systems, Inc.'s Postscript page description language and high-resolution graphics. Lotus will also offer six months of free software support.

The disk, dubbed Value Pack, costs $15 and is available directly from the company or through Lotus dealers later this month.

A single disk, however, can remove protection from multiple copies of 1-2-3 and can also upgrade a number of users to the new features of Value Pack, said Chris Randles, senior product marketing manager for 1-2-3. "They are allowed to copy it internally. It is not restricted," Randles said. Value Pack is only available for the current product release and not for the original 1-2-3 Release 1.

Copy protection has been the bane of many MIS professionals who were commonly forced to go back to the vendor to replace software lost because of disk crashes, spilled coffee or wear and tear.

Most often, the backup disk provided by firms such as Lotus would allow the user to get back up and running. But frequently, the backup would refuse to function. Meanwhile, frustrated users were suspended in a sort of software limbo.

"I have seen cases where the backup just doesn't work," explained C. Thomas Hendrix, manager of information services at Aluminum Company of America. Hendrix applauded Lotus's decision to strip protection from its current release of 1-2-3, allowing users to create multiple backups. Prior to last week's announcement, Lotus had detailed plans to dump copy protection when 1-2-3 Release 3.0 shipped, an event originally slated for early this year. The firm had not announced plans to remove protection from its current version of 1-2-3.

Lotus was the last holdout among the major software vendors. Last year, Microsoft Corp. and Ashton-Tate Corp. completed the phaseout of protection.

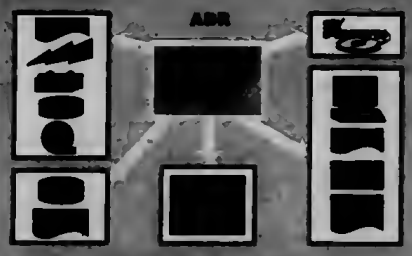
on Oct. 17, 1988.

That's a lot of reporting...
but it's nothing compared
the reports you get with

ABR is capable of generating a wide range
of reports for the DASD Management user.
Extensive TSO/ISPF panels are supplied.
NEW FLEXIBLE REPORTING-ABR
very flexible set of commands and panels
dataset selection and the fields to be displayed.
datasets by any qualifier or characters within the
contained in the VTOC, Catalog or ABR system
Example: Select all datasets containing a 3 character field
3 and an index level of TST anywhere and the size of the
XSELECT XDSN=3/./.**TST**, SIZE > 100

So, whether or not your reporting needs are of world record
call Innovation and we'll send you a Free No Obligation 90
DASD Management system...and you will receive Free, the
Guinness Book of World Records.

*Reference Guinness Book of World Records edition



Available for IBM, OS, VSI, MVS and MVS/XA

INNOVATION DATA PROCESSING

Innovation Plaza, 275 Paterson Ave., Little Falls, NJ 07424 • (201) 890-7300

OS/2 push steals Comdex show

BY ED SCANNELL
CW STAFF

ATLANTA — In what was the center of attention for many of the 50,000 attendees at last week's Comdex/Spring '88 show here, IBM and Microsoft Corp. had more than 70 developers showing off their OS/2-compatible applications.

While 130 applications were demonstrated at the show, only 60 are currently shipping. But the key applications that figure to entrench OS/2 in corporate America are not scheduled to be available until late this year or early 1989.

Many vendors in the IBM-Microsoft booth were optimistic about their chances in the OS/2-compatible market as corporate customers at the show told them that migrating from DOS to OS/2 was an inevitability.

Death, taxes and OS/2

"Customers have been telling us it's inevitable that they'll go to OS/2," said Kevin Crenshaw, director of OS/2 development at Wordperfect Corp. "OS/2 is flexible; it was written to be easily changed."

But Wordperfect will not have a compatible version of its best-selling word processor available until late this year, according to Crenshaw. Likewise, Lotus Development Corp.'s 1-2-3 Release 3.0 also will not be available until the fourth quarter.

"Application tools like [1-2-3 Release 3.0] should create demand for OS/2," said Chuck Sullivan, a marketing support specialist at Lotus.

ALAN S. WEINER/GAMMA-LIAISON

Curious users *flocked to OS/2 booth.*

Most developers last week said they expected only about 10% to 15% of their existing customers to move to an OS/2 version one year after those products become available.

One reason movement toward OS/2 and compatible applications will be slow is the ongoing scarcity of memory chips and their skyrocketing cost during the last few months (see story page 1). Microsoft Chairman Bill Gates, however, said he does not think the shortage will severely affect OS/2 applications development.

"It might have a minor impact over this calendar year, but eventually [chip manufacturers] will catch up in early 1989. I don't think it will have a measurable impact on OS/2 development," Gates said.

And though there were 70 developers showing OS/2-compatible applications at Comdex, only two were showing works-in-progress that ran under Microsoft's Presentation Manager. Those developers, Aldus and Micrografx, Inc., are not expected to have compatible applications available until very late this year, at the earliest.

Rollout sleigh chock-full

ATLANTA — While there was a lack of blockbuster announcements from major players at last week's Comdex/Spring '88, the 700 or so vendors attending announced hundreds of new products and enhancements to existing ones.

Alpha Software Corp. demonstrated a five-function program that directly accepts Ashton-Tate Corp. Dbase III and Lotus Development Corp. 1-2-3 data formats. Called Alphaworks, the $195 program integrates word processing, data base, spreadsheet, graphics and communications functions. The program also contains a spell-checker and thesaurus.

The program works with **Hyundai Electronics America**'s desktop messaging product, The Intelligent Phone System, also formally announced at last week's show [CW, May 2]. The system will be bundled with Alphaworks.

10Net Communications upgraded the performance and capabilities of its network operating system with the introduction of 10Net Plus, which integrates **Consumers Software, Inc.**'s Network Courier electronic mail package. An IBM Personal System/2 version will sell for $695 per node, and a fiber-optic configuration will go for $895 per node.

Universal Data Systems, Inc. enhanced its line of modems with the Sync-Up V.32, an internal plug-in modem for the IBM Personal Computer, capable of full-duplex 9.6K bit/sec. on two-wire dial-up lines, and the Sync-Up V.22 bis/2, an IBM PS/2-compatible plug-in modem that allows full autodialing in both asynchronous and synchronous modes.

Brighton Development announced that its Netmanager and Netremote products will support **Banyan Systems, Inc.**'s Virtual Networking Software, or Vines, networks. Netremote allows network users to access any PC on a local-area network, and Netmanager expands the capabilities of Netremote to include data base management functions. Both versions are scheduled to ship by July 1.

Networking manufacturer **Gateway Communications, Inc.** announced a high-speed G/X25 Gateway wide-area networking product for any LAN using Novell, Inc.'s Netware. The product is an enhanced version of the gateway portion of the G/X25 Gateway and Bridge and will sell for $1,695.

RAM chips

FROM PAGE 1

comes the need for more RAM. Some said that at least 3M or 4M bytes are needed to take full advantage of the new operating system. With too few mainstream applications available for OS/2, end-user memory costs of $750 to $1,000 per megabyte are difficult to justify, according to analysts.

Dynamic RAM prices have skyrocketed in recent months. During the second quarter of 1987, for example, spot pricing per chip for 256K-bit dynamic RAM was less than $2, but rose to $4 to $5 by the fourth quarter and is now running from $8 to $12, according to Drew Peck, a semiconductor analyst at Donaldson, Lufkin & Jenrette, Inc. in New York.

Spot pricing is the price paid for quantities usually less than 100 and is typical of the cost smaller computer makers must pay when unable to negotiate a contract in advance with a dynamic RAM supplier.

Spot prices for 1M-bit dynamic RAM chips have ballooned as well. Currently, prices per chip range anywhere from $20 to $60 and, in some cases, up to $60 to $90, according to a spokesman for Micron Technology, Inc.

Efforts are under way to ease the situation, however. Dynamic RAM manufacturers are beginning to ramp up manufacturing capabilities to meet demand as well as to refocus efforts on 1M-bit chips.

"We are at the peak of the shortage now, and the results of production increases will probably start showing up at any time," said Howard Dicken, president of DM Data, Inc., a semiconductor consulting firm in Scottsdale, Ariz. There will not be any dynamic RAM surplus by year's end, and market prices will still be inflated, Dicken added, but the chips will at least be more plentiful.

The problem lies in manufacturing, observers said. Dynamic RAM makers are in a transition, with most moving away from manufacturing the current generation of 256K-bit chips in favor of 1M-bit silicon. Meanwhile, demand for microcomputers has increased dramatically in the last year.

Less than two years ago, offshore manufacturers were flooding American shores with low-cost dynamic RAM chips. The flow dried to a trickle once the Reagan administration blasted Japan for pricing American manufacturers out of the market and forced an anti-dumping agreement on Japan chip makers.

'Ill-conceived'

"That agreement was ill-conceived," Peck said. "Instead of Japanese chip makers supplying the U.S. market with dynamic RAMs at reasonable prices, they cut their supply down, and prices rose." It was the semiconductor industry that pressured the Reagan administration to take protectionist action, however.

Prior to the agreement, many American chip manufacturers abandoned the dynamic RAM market to the Japanese, unable to compete on price. Currently, Texas Instruments, Inc. and Micron are the only American dynamic RAM manufacturers.

Despite some glum forecasts for the months to come, there are signs of encouragement. Beginning later this year, some makers will begin shipping 4M-bit dynamic RAM chips in production quantities. Toshiba Corp., TI, Hitachi Ltd., Micron and others are developing 4M-bit production capabilities for the open market, while IBM is readying a 4M-bit supply for its own Personal Computers and Personal System/2 line.

Chip shortage waylays Mac SE

BY JULIE PITTA
CW STAFF

A new version of the Macintosh personal computer has been delayed indefinitely as Apple Computer, Inc. struggles with a shortage of memory chips.

According to sources, an upgraded model of the Motorola, Inc. 68000-based Apple Macintosh SE, with more memory and a 40M-byte hard disk drive, was to be unveiled earlier this year. The Macintosh SE was introduced slightly more than a year ago. However, a widespread shortage of dynamic random-access memory chips postponed its debut.

Apple officials declined to comment on the postponement but conceded that the dynamic RAM scarcity is serious. Last week, Apple raised prices of its memory expansion kits for the Macintosh and its Laserwriter II NTX printer as a consequence of significant increases in memory costs.

The price of the Mac 2M-byte memory expansion kit was hiked from $599 to $849, while the 1M-byte kit's cost was increased from $249 to $349. Apple also raised the price of the 4M-byte memory expansion kit for the Laserwriter II NTX from $1,199 to $1,699.

Several corporate buyers expressed frustration with the shortage. "No matter how much RAM we ask for on the Macintoshes we order, we get 1M byte," said Jim Hayes, a vice-president at Seafirst Corp., a Bankamerica Corp. subsidiary.

Richard Webb, a partner at Peat Marwick, Main & Co., said his firm has been unable to buy Macintoshes with the 2.5M bytes of RAM it desires.

Michael Cromar, director of information resources at American President Companies Ltd., said he has been requesting Motorola 68020-based Mac IIs with 5M bytes of RAM and Mac SEs with 3M bytes of RAM but has been unable to acquire them.

VMCENTER II
Smart Economics.

For the new generation, a new choice in VM systems management.

For a company the size of PepsiCo, it takes a lot to keep the sparkle in your data processing operations. From Pepsi-Cola to Taco Bell, growing user demands have made strong central systems management essential.

Fortunately, as the challenge has grown, so has PepsiCo's ability to meet it—thanks to VM Software and the capabilities of VMCENTER II.

The results: a new performance standard for VM operations. A new level of convenience for data center staff. And a new ability to manage for the long term—knowing the short term is under control.

LEARNING THE VALUE OF RELIABILITY.
At one time, the company relied extensively on in-house software for data center management. Saving some money up front. But quickly paying the price in flexibility, reliability, and peace of mind.

Today, more and more operations are under VMCENTER control. And the results are apparent in everything from backup and tape management to system scheduling and accounting. Performance and reliability are up. Operator errors and administrative headaches are down. While problem resolution is faster, easier, and more accurate than ever before.

VMCENTER II. *THE* VM SYSTEMS MANAGEMENT TOOL FOR THE FUTURE.
This performance is impressive. But it's only the beginning of what VMCENTER II can do. From comprehensive management reports to the automated handling of a broad range of everyday operations, VMCENTER II does more for VM systems management than any other product on the market. Which is why it's the one essential complement to *all* your VM systems—from 9370 to 3090 to whatever the future may bring.

VMCENTER II. Standard-bearer for Pepsi's new generation. Smart solution for today. For more information, write or call:

800-562-7100
703-264-8000

VM Software, Inc.
1800 Alexander Bell Drive
Reston, Virginia 22091

VM SOFTWARE INC.

The VM Experts

© 1987 VM Software, Inc.

1-CWX-880516

COMDEX NOTEBOOK

Debuts and plans made down in the sunny South

The inability of the World Congress Center (WCC) and Atlanta Apparel Mart to accommodate the ever-swelling number of Comdex/Spring '88 exhibitors and attendees means that next year's show will relocate to Chicago, according to Sheldon Adelson, head of the Interface Group, Inc., which is sponsoring the show. But Adelson also expressed "the utmost confidence" that plans for the WCC's expansion will be met and that the show will return to the capital of sunny Georgia by the spring of 1990.

Is it the ***Smothers Brothers, or is it Bill Lowe and Bill Gates?***

IBM staged a flashy party at the WCC to honor 52 developers that have shipped OS/2 applications. The bash was iced by a spirited performance by Gladys Knight and the Pips. Before the funk, however, partiers sat through a hokey routine by ex-*M*A*S*H* actors as well as some wooden joke-telling between Microsoft Corp. Chairman Bill Gates and Bill Lowe, the head of IBM's Entry Systems Division.

Although Novell, Inc. insists that Netware compatibility for Apple Computer, Inc.'s Macintosh still tops its "to do" list, Vice-President of Marketing Mark Calkins revealed that support for Sun Microsystems, Inc.'s Network File System will be announced "within a year."

Waterloo Microsystems, Inc.'s plan to introduce a set of local-area network productivity tools fell through when final details between Waterloo and an unnamed partner suddenly hit rough sledding. A spokesman said the firm will try to have the products ready in time for the upcoming PC Expo, to be held late next month in New York.

Fiber-optic transmission speeds and reduced instruction set computing may be mind bogglers, but they pale compared with a tall blond woman dressed as an Amazon. Computer graphics software maker Sphere, Inc. drew loose-jawed MIS executives to its corner of the show floor with Dondra, a flesh-and-blood rendition of the scantly clad sword-bearing character from one of the company's computer games. But Dondra's appeal was decidedly not universal. "Some people will do anything for money," one show-goer said.

While Zenith Data Systems and Mitsubishi Electronics America, Inc. were showing off black-on-white screen technology for laptops, Hitachi America Ltd. was quietly showing a prototype of a 16-color LCD. The display offers 640- by 200-pixel resolution in a 6.3-in. screen but is not slated to be available for 12 to 18 months, according to a spokesman. The color screen was attached to Hitachi's B16 LX, an Intel Corp. 80286-based laptop currently sold only in Japan.

Also on the laptop front, Comdex attendees speculated that IBM will unveil its 286 Convertible June 2. The 286 will be virtually identical to the 286 laptop that IBM sells in Japan, which features a black-on-white screen and 10-MHz speed. The price is expected to be slightly more than the $4,600 Japanese model.

IBM's Mike Maples noted that Named Pipes is high on the company's priority list, although IBM is not ready to say which ones it will support. In the recent past, Maples has been quoted as saying the subject was relatively unimportant in comparison with other issues. Lee Reiswig, who oversees IBM's OS/2 Extended Edition project, said Named Pipes is not a critical issue, but it is one he places in a category of things the company could do that "could potentially enhance OS/2 [Extended Edition]." Reiswig also said there is a long list of things in that category. IBM is carefully examining its options there and only then will make its decision, he said.

Contributions by James Daly, Ed Scannell and James Martin.

Starlan revved, but too late?

BY JAMES DALY
CW STAFF

ATLANTA — Speedier versions of AT&T's Starlan local-area network and its network operating software created a wave of more than 50 product introductions and enhancements unleashed by the telecommunications giant last week at Comdex/Spring '88.

At the core of the additions to the firm's hardware, software and data networking products was the Starlan 10 network, a 10M bit/sec. Ethernet network that offers users a choice of unshielded twisted-pair wiring, coaxial cable or fiber optics.

AT&T will aim Starlan 10 at companies with a need for high-speed networking — such as users with intensive data base management requirements — when the system becomes available in September.

AT&T also took the wraps off an enhanced version of its Starlan operating system software. Starlan Network 3.0 improves LAN performance up to 50%, an AT&T executive claimed.

But the introductions have already drawn fire from some industry analysts who said AT&T's efforts to beef up Starlan are a case of too little too late.

Watching the world go by

"The market has passed them by," said Thomas White, president of Infonetics, a market research firm in Santa Clara, Calif. He said that AT&T lost its only real advantage — networks that use telephone cabling.

White said that token-ring technology, which was introduced after Starlan, holds 30% of today's LAN market. High-speed Ethernet has a 50% share, followed by Arcnet, which still enjoys a large following. "So why [does AT&T] bother? Who cares?" White added.

Also announced at the show was Information Systems Network Release 5.0, which reportedly allows users to bridge geographically dispersed Starlan and Starlan 10 nets.

On with the show

Comdex attendees *went South this year, but sheer volume will force the show to move to the Windy City next spring.*

Novell fills in OS/2 support

BY JAMES DALY
CW STAFF

ATLANTA — Novell, Inc. unveiled its largest array yet of OS/2 transition support for its Netware network operating system users last week at Comdex/Spring '88.

The firm announced that Advanced Netware Version 2.11 — a local-area network operating system designed for up to 100 concurrent users — will ship next week with built-in OS/2 support.

Additionally, the Provo, Utah, firm said its OS/2 support base will be further expanded by the fourth quarter, when Nondedicated Netware for OS/2 will be included in Advanced Netware and the entry-level ELS Netware Level II.

Also planned are two upgrades to its OS/2 Developer's Toolkit, which shipped in February with the Netware Requester, a device that allows OS/2 to run on Netware LANs.

Novell also released the AT-terminal, which marks the firm's first diskless workstation for Netware Ethernet networks. It is said to autoboot DOS from the shared file server and is slated to be available in June for $1,595.

In addition, the firm unveiled the NE2000 LAN adapter, a 16-bit Ethernet adapter designed as a high-performance file server card for Netware Version 2.0A and higher. It will be available in July for $495.

Compaq, Apple clinch honors in CW awards

Compaq Computer Corp.'s 386/20 captured Best Microcomputer honors, and Apple Computer, Inc.'s Hypercard walked away with Most Innovative New Software Product last week in *Computerworld*'s Annual Microcomputer Awards.

The 386/20 was the choice of 37% of the nearly 1,000 readers who voted, handily beating out Apple's Macintosh II and IBM's Personal System/2 Model 80. Hypercard rolled up 21% of the votes, besting Microsoft Corp.'s PC Excel and OS/2 in second and third place, respectively.

Other winners included the following:

- Best Laptop/Portable Computer: Toshiba America, Inc.'s T5100.
- Best Local-Area Network Product: Novell, Inc.'s Netware 386A File Server.
- Most Useful Micro-to-Mainframe Link Product: Digital Communications Associates, Inc.'s Irma 2.
- Best PC Expansion Board: Plus Development Corp.'s Hardcard 40M-byte version and Intel Corp.'s Inboard 386.

Michael Martin of Westfork Consulting in Bedford, Texas, won a copy of Lotus Development Corp.'s 1-2-3 Release 3.

PHOTO BY ALAN S. WEINER/CAMBRIA-LIAISON

Recipients of ***Computerworld*****'s Annual Microcomputer Awards** *(left to right): Compaq's Ross Cooley, Plus Development's Ray Woodeck, Apple's Joe Schoendorf, Toshiba America's John Rahfeld, Toshiba Corp.'s Tetsuya Mizuguchi, Digital Communications' Douglas Lifton, Intel's Susanne Seigneur, Novell's Fred Garcia.*

Software Engineering of America, helping over 6,000 MVS Data Centers Worldwide run more efficiently.

S.E.A.'s DATA CENTER OPTIMIZER software systems

Guarantees you Substantial and Immediate Savings in many of your most critical areas of Data Center Operations.

PDSFAST DRIVER

PDSUPDTE
FASTGENR

PRO 2

ODDS

SAVRS

TRMS

CF

CFM

CF

FREE – NO OBLIGATION
FORTY-FIVE DAY TRIAL

SEA

(516) 328-7000

Founded in 1982, Software Engineering of America, Inc. now has over 6,000 users worldwide. We attribute our success to two basic philosophies:

1. **PRODUCTS YOU ASK FOR.** Development and enhancement of products based on input from users, like yourself.
2. **24 HOUR RELIABILITY.** An unfailing commitment to first rate technical support, 24 hours a day, 7 days a week.

AT&T hung up on MCI discounts

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — AT&T and MCI Communications Corp. resumed their bitter rivalry last week when AT&T asked federal regulators for permission to fight MCI's pricing tactics with its own discount plans for specific business customers.

AT&T said the proposal, filed with the Federal Communications Commission as Tariff 15, would give it the flexibility to offer special rate plans to individual customers who have been offered discounts by competing long-distance carriers. A spokeswoman said Tariff 15 could apply to voice or data services.

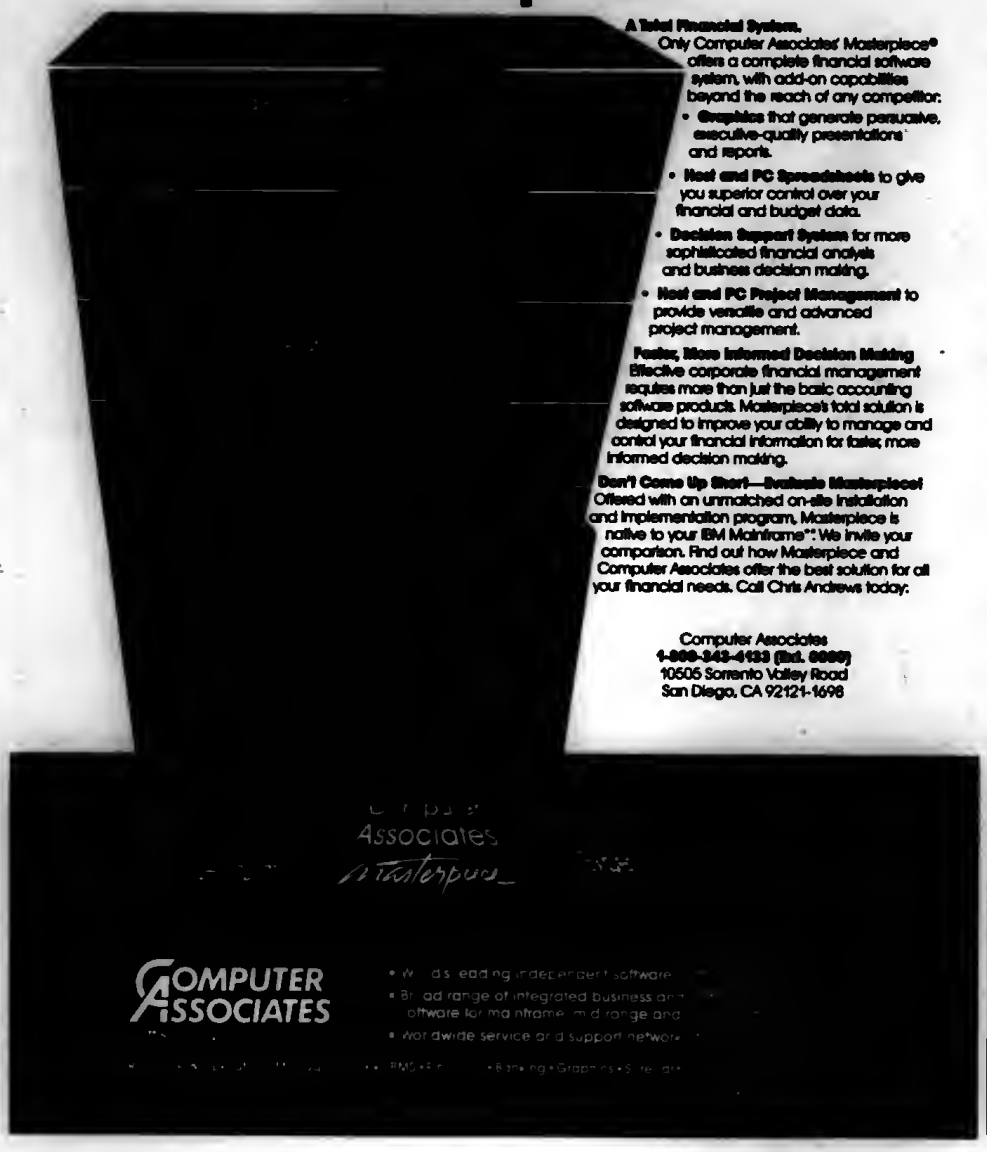
"If other carriers have the freedom to offer special discounts, AT&T must have the same freedom," said Larry Garfinkel, AT&T's vice-president of marketing services, in a statement accompanying the filing.

The proposal is a dramatic departure from ordinary AT&T tariffs, which establish standard rates for all customers to prevent discrimination. It will give the FCC a new opportunity to decide how much freedom it is willing to give AT&T in competing for business contracts.

Also pending before the FCC is an investigation of AT&T's controversial Tariff 12, which allows the carrier to offer custom-designed networks to specific customers such as Du Pont Co., General Electric Co. and Ford Motor Co.

"If Tariff 12 had to be investigated by the FCC due to concerns about discrimination, then this scheme, which is even worse, has to be rejected," MCI said.

Measured Against Masterpiece, All Other Financial Software Comes Up Short.



A Total Financial System.
Only Computer Associates' Masterpiece® offers a complete financial software system, with add-on capabilities beyond the reach of any competitor:

- **Graphics** that generate persuasive, executive-quality presentations and reports.
- **Host and PC Spreadsheets** to give you superior control over your financial and budget data.
- **Decision Support System** for more sophisticated financial analysis and business decision making.
- **Host and PC Project Management** to provide versatile and advanced project management.

Faster, More Informed Decision Making
Effective corporate financial management requires more than just the basic accounting software products. Masterpiece's total solution is designed to improve your ability to manage and control your financial information for faster, more informed decision making.

Don't Come Up Short—Evaluate Masterpiece!
Offered with an unmatched on-site installation and implementation program, Masterpiece is native to your IBM Mainframe™. We invite your comparison. Find out how Masterpiece and Computer Associates offer the best solution for all your financial needs. Call Chris Andrews today:

Computer Associates
1-800-343-4133 (Ext. 6000)
10505 Sorrento Valley Road
San Diego, CA 92121-1698

FCC opens lid on price caps

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Federal Communications Commission last week put some meat on the bare bones of its proposal for using price caps instead of profit ceilings to regulate AT&T and local exchange carriers.

The proposed regulatory scheme would start with carrier rates at current levels and then place an annual cap on rate increases. The price cap would be based on a formula of the inflation rate minus 3%.

In other words, inflation-adjusted rates would be cut 3% a year to reflect the FCC's expectation that the carriers will boost productivity and cut costs under the new regime.

Different calculation

Brian R. Moir, counsel to the International Communications Association, expressed concern that the baseline will be existing rates, because business users consider the telephone companies' so-called strategic pricing plans grossly inflated above costs. He argued that the price-cap formula for local carriers should be inflation minus 7%.

The FCC proposal will be subjected to 60 days of public comments as well as scrutiny by the U.S. Congress, which has been skeptical of the plan since it was first sketched out last August.

The search for an alternative to rate-of-return regulation is based on the contention that the approach gives carriers an incentive to inflate costs and subsidize unregulated ventures.

Other details of the price cap proposal include the following:

- One price cap index would be calculated for a basket of switched network services, and a separate index would be calculated for private-line services. The FCC envisions the price caps beginning April 1, 1989.
- Individual services would be subject to a price band, allowing them to fluctuate no more than 5%.
- AT&T's controversial Tariff 12, offering custom-designed networks for big business customers, would not be included in the price caps.

No Contest!

Users name ORACLE the #1 DBMS

"Oracle Corporation's lead was substantial. No contest!"

applications run everywhere.

Because ORACLE was the first implementation of SQL, the data management standard adopted by IBM, ANSI, ISO and the federal government. But ORACLE isn't just SQL compatible. With such added functionality as *outer joins* and *CONNECT BY*, ORACLE is the most powerful SQL implementation for micros, minis or mainframes.

Because ORACLE has been the best-performing RDBMS on the VAX. **And you haven't seen anything yet!**

Call today, to reserve a seat in the next ORACLE seminar in your area. Learn why database competition is no contest. Find out what ORACLE can do for you.

ORACLE®

COMPATIBILITY · PORTABILITY · CONNECTIVITY

Call 1-800-345-8800, ext. 105 today.

© 1986 by Oracle Corporation. ORACLE® is a registered trademark of Oracle Corporation. The other companies mentioned are respective registered trademarks. 3004

U.S. SEMINARS

AL	Mobile	May 11
AR	Little Rock	Apr 07
AZ	Phoenix	Apr 28, May 26, Jun 23
	Tucson	Apr 27, Jun 22
CA	Costa Mesa	May 12, Jun 06
	Los Angeles	Apr 12, May 17, Jun 14
	Newport Beach	Apr 14
	Oakland	Apr 20
	Ontario	Apr 07
	Sacramento	Jun 21
	San Diego	Apr 08, May 05, Jun 07
	San Francisco	Apr 19, May 12, Jun 16
	San Jose	Apr 28, Jun 30
	Santa Barbara	Apr 19
	Westlake Village	Jun 28
CO	Denver	Apr 26, Jun 15
	Colorado Springs	Apr 14
CT	Hartford	Jun 14
	New Haven	Apr 14
	Stamford	Apr 27
DE	Wilmington	Apr 12
FL	Miami	Apr 14
	Orlando	Apr 13
GA	Atlanta	Apr 19
HI	Honolulu	Apr 08
IA	Des Moines	May 11
ID	Boise	Apr 05
IL	Chicago	Apr 21, May 25, Jun 23
	Springfield	Apr 08
IN	Indianapolis	Apr 12, May 18, Jun 21
KS	Wichita	Jun 22
KY	Lexington	Jun 08
	Louisville	Apr 14, Jun 09
LA	New Orleans	Apr 29, Jun 17
MA	Boston	Jun 15
	Springfield	Apr 12
MD	Baltimore	May 03
	Bethesda *(Federal)*	Apr 07, May 31, Jun 30
	Bethesda *(Commercial)*	May 10
MI	Detroit	Apr 05, Jun 07
	Grand Rapids	Apr 08
MN	Minneapolis	Apr 26, May 24, Jun 16
MO	Kansas City	Apr 21, Jun 23
	St. Louis	Apr 14, May 17, Jun 07
MS	Jackson	Apr 12
NC	Charlotte	Apr 06
	Raleigh	May 12
NJ	Iselin	Apr 21, May 12, Jun 07, Jun 28
	Princeton	Apr 19, May 24, Jun 21
NM	Albuquerque	Jun 16
NV	Las Vegas	Apr 21
NY	Albany	Jun 07
	Buffalo	Apr 13
	Long Island	Apr 13
	New York City	Apr 20
	Rochester	Apr 20, Jun 08
OH	Cincinnati	Jun 15
	Cleveland	Jun 16
	Columbus	Jun 14
OK	Oklahoma City	Jun 17
	Tulsa	Apr 14
OR	Portland	Jun 09
PA	Harrisburg	Jun 23
	Philadelphia	Apr 15, May 12, Jun 06
	Pittsburgh	Jun 21
	Scranton	May 17
	Valley Forge	Apr 21, May 19, Jun 16
SC	Columbia	Apr 04
	Greenville	Apr 05
TN	Nashville	Apr 06
TX	Austin	Apr 22, Jun 08
	Dallas	Apr 06, May 03, Jun 07
	Houston	Apr 28, Jun 16
	San Antonio	Apr 21, Jun 09
UT	Salt Lake City	Apr 12, Jun 28
VA	Richmond	May 03
	Virginia Beach	Jun 09
VT	Burlington	Apr 06
WA	Seattle	May 05, Jun 07
	Spokane	Apr 12
WI	Madison	Apr 20
	Milwaukee	Apr 13, Jun 06

CANADIAN SEMINARS

To register for Canadian seminars, please call the office nearest you. Calgary **403-265-2622**, *Ottawa* **613-238-2381**, *Quebec* **514-337-0755**, *Toronto* **416-596-7750**.

Calgary	Apr 14, Jun 16
Edmonton	May 12
Halifax	Apr 21, Jun 09
Kingston	Apr 15
London	Apr 07
Montreal	Apr 27, May 25, Jun 22
Ottawa	Apr 07, May 05, Jun 09
Quebec	Apr 06, May 04, Jun 08
Regina	Apr 07
Toronto	Apr 12, May 10, Jun 10
Vancouver	May 12
Victoria	May 26
Winnipeg	May 19

Attn: National Seminar Coordinator
Oracle Corporation • 20 Davis Drive
Belmont, California 94002

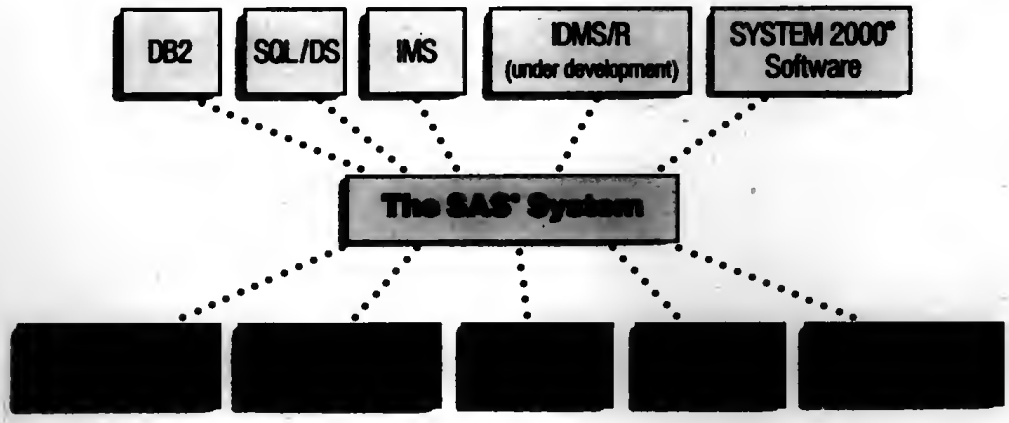
☐ My business card or letterhead is attached. Please enroll me in the *FREE* ORACLE seminar to be held

at: _____

on: _____

COMPUTERWORLD

Get the Facts from Your DBMS.



The most powerful applications software has joined forces with the most popular data base management systems. To turn raw data into meaningful facts. To analyze, estimate, optimize, simulate. To produce custom reports and color graphs. Whatever your information need, the SAS System delivers more from the data you store.

Don't Just Store Your Data. Explore Your Data.

The SAS System's ready-to-use tools uncover the real meaning of all those names and numbers. Forecast sales and cash flow. Perform statistical analyses. Build financial and planning models. Create spreadsheets of unlimited size. Schedule projects for best use of time and resources. Produce stacks of personalized letters. Generate calendars, charts, and many other formatted reports. Spot relationships and graph trends with powerful presentation graphics.

Or develop your own applications with the SAS System's efficient fourth-generation language. Customize these applications any way you wish.

who know nothing about data bases, have immediate access to the data they need. It's as easy as filling in the blanks!

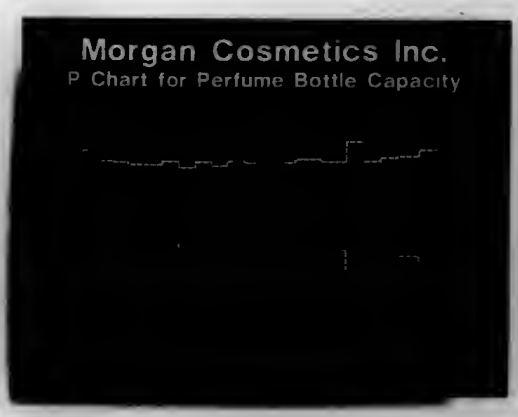
Extract data from your DBMS for use in SAS System applications. Load data from the SAS System directly into your DBMS.

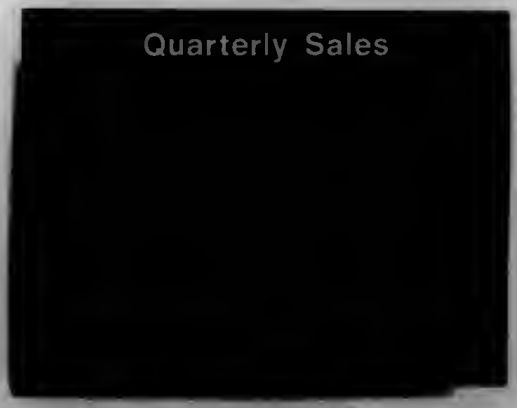
Update values in a data base directly from a SAS System application. All without risk to data security. The SAS System lets you choose which users browse or update specific files.

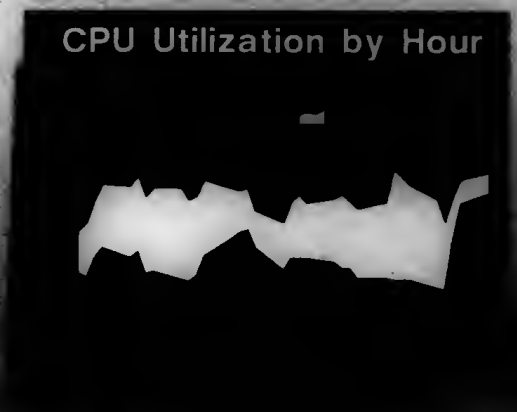
Get the Facts Today. And Get 30 Days Free.

Bring the SAS System together with your data base. You'll receive high-quality software—plus training, documentation, and support—all from SAS Institute Inc. [illegible] to get [illegible]

Get the SAS® System.







Prime to slash work force by 700

BY NELL MARGOLIS
CW STAFF

NATICK, Mass. — Rumors of an impending massive layoff at Prime Computer, Inc. jelled into fact last week as the company announced the elimination of 700 positions, largely in the manufacturing area.

The Prime cuts, which will reduce the company's approximately 13,500-employee work force by 5%, will cure operational and manufacturing redundancies resulting from Prime's merger last winter with Computervision Corp., the Bedford, Mass.-based computer-aided design and manufacturing player, according to a Prime spokesman.

Direct sales jobs are not among the 700 cuts, he said. "If anything, we may even increase direct sales." Research and development is also expected to remain unaffected.

Market analysts viewed the move as a healthy one in terms of Prime's cost structure and called it inevitable in the wake of the merger with Computervision, a hostile takeover that cost Prime $435 million.

While the dispensable positions have been targeted, no one has been laid off yet, the Prime spokesman said. The actual elimination, scheduled to take place during the balance of the year, will affect both the Prime and Computervision divisions. "There isn't any victor-and-vanquished mentality governing this," he said.

Several analysts, however, speculated that the reduction will take its greatest toll from the Computervision ranks, "which were pretty manufacturing-heavy even before the acquisition," according to Martin Ressinger, an analyst at Duff & Phelps, Inc. in Chicago.

Prime said it will relocate employees to other posts within the company wherever possible and provide counseling, outplacement services and severance packages.

TI unveils VT220 unit

BY STANLEY GIBSON
CW STAFF

TEMPLE, Texas — Texas Instruments, Inc. announced last week what it claimed to be the first laptop terminal that is plug-compatible with the Digital Equipment Corp. VT220 terminal.

The Travelmate LT220 terminal uses a 25-line LCD screen, weighs less than five pounds and can be powered by batteries or by connecting to an electrical outlet.

Laptop portables from several manufacturers currently offer VT220 emulation, but the Travelmate LT220 will be less expensive and easier to operate for users requiring only the terminal function, according to Randy Bustos, TI marketing manager.

The Travelmate LT220 is priced at $899. Built-in modems, operating at either 1,200K bit/sec. or 2,400K bit/sec., are priced at $299 and $399, respectively. A backlighting option costs $200.

The laptop can attach to a printer "cradle," an optional portable assembly that can also include a numerical keypad. Either a thermal or ink-jet printer is offered, each costing $549. The cradle with a printer and a keypad is priced at $599.

The laptop can be changed to offer emulation for different kinds of terminals by changing an erasable programmable read-only memory chip, according to Bustos.

Thus, a large user, buying a number of terminals, might want to customize them, he said.

The terminal can contain up to 64K bytes of internal random-access memory in 32K-byte units, priced at $49 each. Additional memory is available on credit-card-size plug-in cards.

The Travelmate LT220 is scheduled to ship at the end of June.

We're Making It Easy For

AST Premium Connectivity™ Products. The names on these mailboxes are some of the most important families in American business. The computer families that companies trust to process, store and exchange vital data.

Now, AST is making it easy for these families to live together. That's because our own family of Premium Connectivity products is designed with advanced features and top-of-the-industry speed and performance. Plus, compatibility with existing and emerging industry standards.

Local Area Networking. AST offers a wide selection of networking products, including AST-Ethernet,™ the fastest Ethernet adapter in the industry. It offers flexibility, compatibility and unprecedented throughput for I/O intensive applications.

Besides AST-Ethernet, we offer the AST-StarSystem™ and the AST-Resource Sharing Network.™ And if you've already installed a LAN, and want to expand, AST-Advanced Netware™ can bridge old networks to new ones.

PC-to-Mainframe Connectivity. We put an end to the issue of standards. If you're tired of figuring out the advantages of IRMA® over IBM, or IBM over IRMA — forget it. AST-3270/CoaxII™ offers hardware, API and keyboard compatibility with both standards.

And if you're looking for speed, versatility and key features in DFT and APA graphics, check out the software options for AST-3270/CoaxII.

When you're ready to make remote 3270 SNA/SDLC connections from your PC or PS/2, try AST 3270/SNA II.™ It offers: multiple sessions, 3287 printer support, keyboard macro facilities and much more.

The AST PC-to-Mainframe family also includes 3770, 3780, BSC and SNA Gateway products.

PC-to-3X Mini Connectivity. Our 5250 emulation products have been built around careful family planning. Our System/3X connectivity solutions include: Local, Remote, Gateways, Clusters and Async Dialup. And, they all work with the new PS/2s, as well as the AT/PC architecture.

Enhanced AST-5251/11 Plus™ has captured the attention of the industry with its emphasis on features. Features like: seven concurrent display/printer sessions,

DEC fleshes out real-time line

BY STANLEY GIBSON
CW STAFF

MARLBORO, Mass. — Digital Equipment Corp. bolstered its real-time computing offerings last week, introducing a real-time accelerator for its VAXBI-based systems and three real-time versions of its Microvax 3000 series processors.

The VAX Realtime Accelerator, also known as VAX RTA, for systems using the VAXBI bus can turn BI systems, including the recently introduced VAX 8800 and 6200 series of symmetrical multiprocessing systems, into real-time systems.

"Originally, you had to develop a real-time application on a separate VAX system, then you would have to port that over to a real-time system running VAXELN to communicate with shop floor devices. Now, with a BI-based system, you can do it all on one system," explained Stephen Widen, a DEC analyst at International Data Corp. in Framingham, Mass.

The previous DEC real-time offerings were Q-bus-based and ran only real-time applications under VAXELN, DEC's real-time operating environment. They did not run VMS as well, as will BI-based systems with a VAX RTA coprocessor.

DEC cut prices on its previous systems — the RT VAX 1000, the IVAX 620 system for industrial applications and the KA620 single-board computer — by up to 40%. Those systems are all based on the Microvax II.

DEC also introduced VAXELN Version 3.1, which allows memory to be addressed as a virtual disk.

The VAX RTA hardware is priced at $7,500. Up to five optional 2M-byte memory boards are priced at $2,500 each. The VAXELN Version 3.1 license is priced from $4,920 to $14,760, depending on the system in which the RTA is used.

RT VAX 3000 series machines — the RT VAX 3200, 3500 and 3600 — come bundled with VAXELN. All systems come standard with 8M bytes of main memory. The RT VAX 3200 can be expanded to 16M bytes, and the RT VAX 3500 and 3600 can be expanded to 32M bytes.

The RT VAX 3200 is priced at $18,950, the RT VAX 3500 at $24,000 and the RT VAX 3600 at $65,000. All the products are slated to be available in June.

DEC, Compaq agree to deal

MAYNARD, Mass. — Digital Equipment Corp. signed a technology exchange and support agreement with Compaq Computer Corp. last week.

While acknowledging that Compaq computers already work in the Decnet environment, DEC asserted that it will complete a certification program for Compaq equipment within 30 days.

In addition, DEC pledged to provide nonwarranty service for Compaq products within DEC-based networks.

Beyond formalizing DEC support for the large and growing Compaq population at DEC user sites, the agreement also allows the two vendors to exchange product specifications and commit development resources to ensure the integration of future Compaq personal computers into DEC networked systems.

Families To Live Together.

advanced file transfers, a new cable connection that uses inexpensive telephone wire (RJ11) and an on-board 80186 CPU for maximum performance. All of this for the PC and the PS/2, too.

Connectivity Stations. Looking for a great PC that's already configured for connectivity? AST offers the AST Premium LAN Station,™ the AST Premium 5250 Station™ and the AST Premium 3270 Station.™

Based on a revolutionary, small-footprint 286 personal computer, these Premium Connectivity Stations are powerhouses of desktop computing and terminal emulation.

We're Really A Family Business. When it comes to getting families to work together, AST has it all. And in an age when standards seem to exist only to be broken, AST stands committed to providing the very best connectivity products for your needs, for today and tomorrow.

If you're interested in finding out more about AST Data Connectivity products, call AST at: **(714) 863-9991, operator AC2** or send in the coupon.

☐ Yes, send me an AST product catalog.
☐ Yes, have an AST respresentative call me.
Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Send to: AST Research, Inc. 2121 Alton Avenue Irvine, California 92714-4992, Attn: M.C. CW 5/16/88

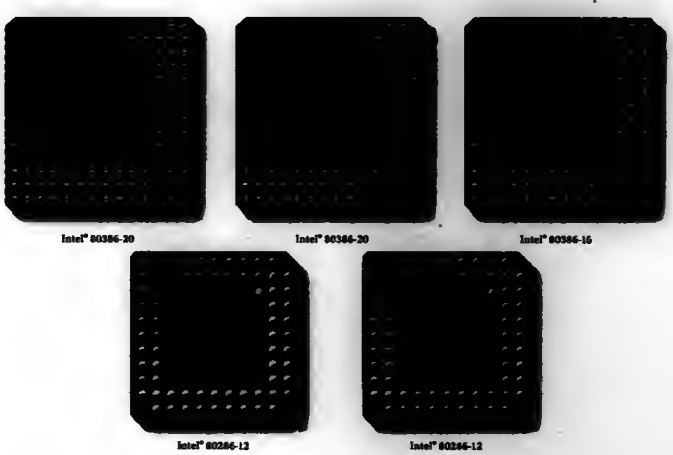
AST RESEARCH INC.
Times Have Changed.

AST markets products worldwide—in Europe and the Middle East call: 44 1 369 4800; in the Far East call: 852 5 717323; in Canada call: 416 886 7914. AST and AST logo registered and AST-Ethernet, AST-StarSystem, AST-Resource Sharing Network, AST-3270/Coaxll, AST-3270/SNA II, Enhanced AST-5251/11 Plus, AST Premium LAN Station, AST Premium 5250 Station and AST 3270 Station trademarks AST Research, Inc. IBM registered and PS/2 trademark International Business Machines, Corp. IRMA registered trademark Digital Communications Associates, Inc. Copyright © 1988 AST Research, Inc. All rights reserved.

VM/CMS USERS
Developing Applications?
Use XMENU/2 for Total Full-Screen Support.
- Powerful REXX Interface
- Fast screen painter
- High-level language support
- Extensive validity checking
- Complete 3270 support

Call Now: 408/980-0484
Kolinar Corporation
3064 Scott Blvd., Santa Clara CA 95054

These give you high-performance personal computers.



COMPAQ personal computers offer far more than advanced, high-speed microprocessors. Each offers a combination of innovative features which work with the processor to maximize overall system performance. So there's nothing to slow you down.

Take system architecture, for example. The COMPAQ DESKPRO 386/20 and COMPAQ PORTABLE 386 are built around an advanced 32-bit concurrent bus architecture which exploits the speed of the computers' 20-MHz 80386 microprocessors. Two buses—one for memory and one for peripherals—eliminate information bottlenecks, allowing each component to run at its maximum speed. This ensures the highest system performance without sacrificing compatibility with industry-standard hardware and the world's largest library of business productivity software.

Similar performance enhancements are engineered into each subsystem of every COMPAQ personal computer. Each component is then optimized individually, yet designed to work as part of the total system.

For instance, COMPAQ Fixed Disk Drives deliver both high capacity and high performance. You can install up to a 300-megabyte fixed disk drive in the COMPAQ DESKPRO 386/20 and up to a 100-megabyte drive in the COMPAQ PORTABLE 386. More importantly, you can get to that data almost instantly thanks to some of the industry's fastest access times—averaging less than 30 milliseconds. When you combine this speed and capacity with disk caching, the result is the highest-performance storage subsystem in the industry. To take it one step further, Compaq helps

*Based on an independent study of major brands. COMPAQ®, COMPAQ DESKPRO 386® and COMPAQ DESKPRO 286® are registered trademarks of Compaq Computer Corporation. ®Registered U.S. Patent and Trademark Office. COMPAQ DESKPRO 386/20™ COMPAQ PORTABLE 386™ and COMPAQ PORTABLE III™ are trademarks of Compaq Computer Corporation. IBM® is a registered trademark and IBM PS/2™ is a trademark of International Business Machines Corporation. Intel® is a registered trademark of Intel Corporation. ©1988 Compaq Computer Corporation. All rights reserved.

These give you the highest-performance personal computers.

you protect that data with internal high-speed fixed disk drive tape backup systems.

Another graphic example of Compaq total system performance comes from the COMPAQ Video Graphics System. This system supplies VGA graphics with high-resolution COMPAQ Color and Monochrome Monitors along with speed enhancements from the COMPAQ Video Graphics Controller Board. When the board is used in a 16-bit slot, it makes screen updating 50% faster than the IBM® PS/2™ Video Graphics Array and other comparably equipped systems.

Uncommon performance innovations like these are common to all COMPAQ desktop and portable personal computers. That's clearly why each one is the best in its class, and why together, they represent the most powerful line of personal computers in the world. That's also why Compaq consistently earns the highest performance and quality ratings from computer experts. And unsurpassed satisfaction ratings from computer users.*

Any computer can use a fast microprocessor. But it takes high-performance subsystems surrounding the processor to achieve the highest system performance in the world. The kind achieved by Compaq.

For more information and the location of the Authorized COMPAQ Computer Dealer nearest you, call 1-800-231-0900, Operator 49. In Canada, 1-800-263-5868, Operator 49.

COMPAQ

It simply works better.

EDITORIAL

On the contrary

CONSIDER THE FOLLOWING editorial page excerpt:

"The individuals [micro managers] who championed PCs seem to be losing the war for influence inside the corporation. . . . In most companies, PC managers are inching along the slowest track."

Now consider this one:

"The influence of micro managers and information center managers has grown — not diminished — since 1986."

It's not unusual for the editorial pages of different trade publications to present opposing views on the same issue. But the quotes above appeared in the same widely read publication — *PC Week* — just a year apart.

Aside from the obvious contradictions — each editorial page was supported by other stories in the paper — the most recent selection that outlined a declining role of MIS in certain personal computer acquisition policies is nothing short of an outrageous flight of fancy. And this particular flight is contrary to one of the most apparent trends in information management today.

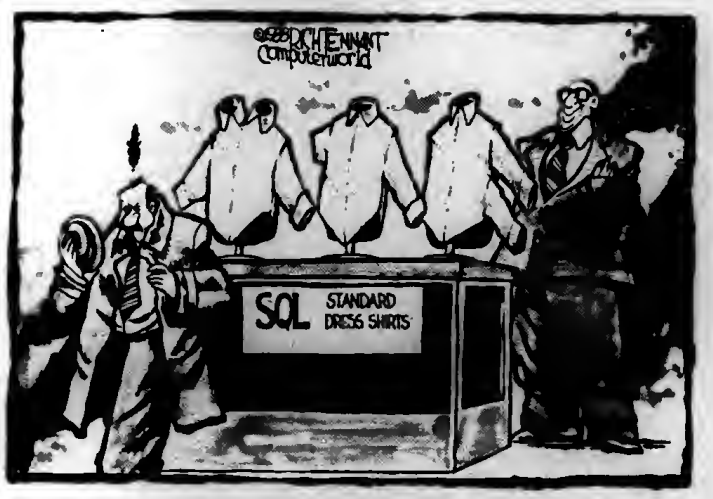
For example, consider the following:

- The most comprehensive study on PC acquisition and usage patterns, completed by International Data Corp. and Stat Resources, Inc. late last year, found MIS to be the dominant force in the planning and acquisition process in medium-size and large companies.
- In a comprehensive 1988 Gallup Poll of the Fortune 1,000, sponsored by *Computer Reseller News*, two-thirds of the respondents cited as having the greatest influence in the PC acquisition process were from data processing. When respondents were asked who else was involved in that process, 67% named senior MIS managers.
- In two studies conducted by *Computerworld* last year, MIS/DP was cited as the primary determinant in PC purchases in 60% to 70% of medium-size and large companies.

Why are the results in these studies so consistent? Because they reflect the reality of an information environment in which PC equipment is rapidly becoming an intrinsic part of an integrated information system, not another stand-alone appendage. As such, MIS plays a key role in crafting the components of that system.

With the one notable exception cited above, publications have generally echoed one message loud and clear: PCs are a major player in the increasingly integrated information systems schemes being crafted by corporations and are no longer the single-user phenomenon that has long been cast as a romantic outlaw.

The reality is that equipment purchase decisions must reflect the interests of several parties, from end users to department managers to senior MIS, with someone having the "right of last refusal." Whatever the case, information professionals need, want and deserve nothing short of consistent, reliable data. One simply cannot ignore the dynamics of that or wish it to be something other than what it is.



LETTERS TO THE EDITOR

Step backward?

I missed the point of the In Depth article on three women who gained power in the industry [CW, March 28], unless you were simply looking to fill space with excerpts from a book.

I respect, and certainly commend, these women. But in these times, and certainly in this industry, singling out women is a step backward.

Paula J. Brooks
President
Unitech Software, Inc.
Reston, Va.

The last word

Up until March 7, your coverage of Section 1706 had been fairly evenhanded. You gave both proponents and those against Section 1706 equal time. Granted, this is a highly charged issue with possibly severe adverse effects on the parties involved. As such, one could expect the emotional rhetoric exhibited in the Letters to the Editor section.

As an independent consultant, however, I resent two back-to-back issues being devoted to those who advocate keeping Section 1706 in its present state [CW, Feb. 29 and March 7]. An examination of the sources of the letters supporting Section 1706 clearly showed that the majority were written by those who stand to gain the most from it — large consulting companies. It is beyond comprehension to see such a blatent attempt to limit competition in the consulting field. In the final analysis, however, the ultimate losers as a result of Section 1706 will be companies that utilize the services of large consulting companies. History has shown that any time competition is restricted, prices tend to rise.

In order to balance your coverage of Section 1706, I suggest you find experts not affiliated with large consulting companies or independent consultants and let them express their opinion on the merits for or arguments against Section 1706.

Robert A. Uhrin
President
Computer Programming Resources
Des Plaines, Ill.

Not all roses

In reference to Charles Lecht's column "The doggonedest computer ever seen" [CW, March 21], I must take issue with his uncritical raves for the K9.

Though I am the proud owner of two Japanese K9s, all is not throughput and roses. While the intelligence of the system cannot be denied, this has a downside: The system often has its own way of doing things, and the operator either fights or goes along for the ride.

There are also hardware problems. New models tend to leak fluid, and it can be six to eight months before this glitch is completely overcome. It is also true that new models tend to consume bytes without being so ordered; the damage to other, unrelated systems can only be imagined. Repairs tend to be expensive and time consuming — these days, there is almost no such thing as on-site K9 repair.

However, I must admit that the affection an operator will develop for a K9 is unmatched; let Apple Computer, Inc. challenge that.

Bernie Jacobs
Computer Operations
The Markham Co.
New York

Due credit

I read with interest the Spotlight on data base management systems [CW, March 14]. However, I would like to point out omissions or errors in two articles.

In "Data dispersal starts as trickle," the author stated that no true distributed DBMS exists today. Nonstop SQL, Tandem Computers, Inc.'s implementation of the SQL data language, supports a fully distributed relational DBMS for Nonstop systems. Users can read, write and update data anywhere in a network, including distributed updates within a single transaction, with data base integrity and consistency protected.

A second article, "Hierarchical model keeps loyal following," quoted sources who said the performance of relational DBMSs is inferior to hierarchical data bases and not capable of high-volume processing.

Relational systems have had a reputation for poor performance. But Nonstop SQL, introduced in March 1987, performs comparably to traditional non-relational systems. In a Debit/Credit benchmark audited and verified by the Codd and Date Consulting Group, Nonstop SQL ran at more than 200 transaction/sec. with 90% ending in two seconds or less.

Patricia A. Ridgway
Director of Marketing Support
Tandem Computers, Inc.
Cupertino, Calif.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Let your fingers do the voting via telephone

Computers could better tally the people's will

CHARLES P. LECHT

In November, Americans will elect a president once again. And once again, the massive U.S. governmental resources invested in computer technology will play little or no role in the voting process.

The world's most technologically advanced governments continue to ignore the obvious role computer systems, linked together in a national network, could play during elections.

If used at all, most computers are relegated to the role of adding, sorting and listing. Is it too much to ask that this technology also collect, convey and tally the votes of citizens untouched by — perish the thought — morally weak human hands?

Computerized voting that takes advantage of in-place communications networks and the telephone could overcome many defects in the archaic manual processes currently used. To a critical degree, these defects are the same ones that inspired the creation of America's electoral college in the 18th century.

To continue to use surrogate voting to deliver the collective will of a community is anachronistic in a time when the individual votes of its citizens are so easily delivered.

Computerized voting via telephone for the president on down could go a long way toward reviving the dwindling interest in voting among Americans.

Whom do you trust?

Today, people have little choice but to trust computer and communications technologies to help control their most vital life functions. Banking, credit, air traffic control, weather prediction, defense — you name it — all rely on these technologies. So why not voting too?

When these technologies were underused, we experienced the likes of the Chernobyl and Three Mile Island catastrophes. We have grown beyond relying on human control of the processes with which we must deal in this world, and we may as well face up to it. That includes voting, too.

As seen from the perspective of the average citizen, the most sophisticated use of computer and communications technologies in American elections is made by television and radio stations. The picture of a government unable to carry out an election using the same technology that the broadcast studios do to forecast results is neither complimentary nor convincing.

There are benefits to be gained by muzzling the forecasters during the voting. According to one ABC New York newsman, predictions on voting day can change a candidate's vote by as much as 30%. Though Americans are often for the underdog, they are never for the dead dog.

> TO CONTINUE to use surrogate voting to deliver the collective will of a community is anachronistic in a time when the individual votes of its citizens are so easily delivered.

All this presents a bleak picture of bureaucrats tolerating the use of computers to possibly influence an election and accepting the nonuse of computers when they could facilitate elections being run more fairly.

Needless to say, implementing a system to carry out voting via telephones interconnected with computers is no trivial task. But it's not impossible, considering the Integrated Services Digital Networks now being developed to span most developed countries.

Of course, there are the usual arguments against electronic voting. Some suggest that getting to a telephone may be more difficult than getting to a polling station. Others point out real problems, such as how voters can be identified over the telephone, or how we can protect ourselves from some hacker's computer penetrating the system and using an electronic telephone book to cast several million votes for a candidate.

But if you think about it, the chances for mischief are far greater in today's decentralized, archaic voting systems, and detection is less automatic in the old system than we may expect it to be in centralized electronic voting.

Whatever the case, it is difficult to contest the fact that current technology can be used to ensure that the will of the people — all of the people — can be carried out in a fully computerized election.

Lecht is an IDG News Service foreign correspondent based in Tokyo.

Speak softly and just fit in

You can start acting like a CIO long before you actually become one

HERB HALBRECHT

Twelve years ago, Richard Nolan's "Business Needs a New Breed of EDP Manager" appeared in the *Harvard Business Review*. To this day, MIS executives quote from it. Sometimes I wonder if they have read any other articles since 1976.

Consider this statement, which sums up not only the article's thesis but the way many MIS directors still perceive themselves: ". . . he must have the perception of a general manager, be ready not only to sell EDP but also to develop and sell the logic and discipline of how one does business in a particular technological environment.

"He must be able to develop in other top executives an appreciation of the value of the systems function and a perception of the requirements for implementation."

This statement was true in the late 1970s and early '80s, but top management no longer needs to be sold on electronic data processing (EDP) or the logic and discipline of technology. What separates the chief information officer (CIO) of today from the "new-breed" information executive of the mid-'70s is the recognition by general managers of the potential for leveraging information technologies for competitive advantage.

We recently conducted two informal surveys, the first directed at highest ranking information executives drawn from the 1,000 largest U.S. corporations and the second questioning chief executive officers of the same companies.

Many of the top information executives who responded — true CIOs by whatever definition — suggested that much of the clamor from MIS professionals is self-serving hype.

The respondents questioned whether the majority of the current MIS executives would ever be able to step up to a CIO-level position at the same strategic level as vice-president of finance, manufacturing or research and development.

Many say that MIS directors would end up reporting to a CIO who was promoted to the position not from the information technology side but from a senior business management capacity.

On the other hand, the CEOs who responded were mostly indifferent to questions about the role of a CIO. They were more concerned with determining how much is the "right amount" to spend on information systems.

As any professional field grows up, going from stage to stage through the maturation process requires different skills

Continued on page 23

TOM LIELEVITCH

Halbrecht is president of Halbrecht Associates, Inc. in Stamford, Conn.

It might be a Mac minister at your door

JAMES A. MARTIN

Once upon a time, the evangelist had a narrow career path — preach in church and, if blessed, progress to the vast kingdom of television.

In the ambitious 1980s, however, even the evangelist has a variety of career options from which to choose.

He can, for example, preside over a cable television network (Jim and Tammy Bakker) or run a university (Oral Roberts). Hostile corporate takeovers can be fun (Jerry Falwell), and frequenting back-street Louisiana motels (Jimmy Swaggart) can generate some hot publicity. And why not take a shot at the presidency of the United States (Pat Robertson)?

If the evangelist still feels in need of occupational therapy, there's always the computer industry.

Apple started the trend toward technology evangelists in 1984. Today, the Cupertino, Calif., company employs a staff of some 30 full-time "priests," whose mission is to spread the gospel to existing and potential third-party developers. They are, in essence, Apple's ambassadors to the development community.

Each evangelist has a specialty — a vertical application. There is a K-12 software evangelist, a consumer software evangelist and an entire subgroup of hardware evangelists, to name a few.

The very idea of evangelists at large in Silicon Valley, preaching solutions instead of salvation, is a bit jolting at first. The imagination runs wild. For example, what kind of frock does the evangelist wear to a power lunch? From which Bible does the evangelist quote — the King James version or the John Sculley remake, *Odyssey*?

Apple first rallied its righteous brothers about the time it introduced the Macintosh. The Mac ministry had quite a selling job to do to convince corporate America that this machine was indeed more useful than a hula hoop.

They succeeded. The Macintosh today is a viable alternative to IBM and, like Jim and Tammy, boasts a devoted following. As a result of Apple's success, evangelists are now all the rage at technology companies struggling to sell untried and mostly unsupported products. Microsoft, for example, has a CD-ROM evangelist, while Hewlett-Packard is evangelizing about its New Wave application environment.

What started as another example of dreaded Applespeak is now threatening to become a mainstream marketing buzzword. But where will it end? Are there Atari evangelists in our future? Will the term spread to nontechnology companies as well, creating such aberrations as Chief Evangelist, Firestone Tire & Rubber Co.? Director of Religious Experiences, Sara Lee Corp.? Department of Miracles and Makeovers, Mary Kay Cosmetics, Inc.?

The possibilities are endless. As Jim Bakker might say, "Stay tuned."

Martin is a *Computerworld* West Coast correspondent.

Service in a whole new light.

ALCATEL CORTELCO*
Second Largest U.S.
Manufacturer of Telephones
and Key Systems

ALCATEL COURIER
3270-Compatible
Controllers and Displays

FRIDEN ALCATEL
Innovative Supplier of
Postage Meters, Mailing and
Shipping Systems

ALCATEL PABX SYSTEMS
Supplier of Advanced
Small and Medium Size
PABX and Key Systems

ALCATEL IS SERVICE

Actually, Alcatel is a synergy of leading information processing and communications companies working together to offer you the systems and services your business needs to compete, prosper and grow.

Such companies as Alcatel SERVCOM.

For nearly 20 years, SERVCOM has maintained and serviced over 400 types of data processing and communications equipment—from PCs to PABXs to mainframes.

And Alcatel SERVCOM does everything from on-site service and depot repair to installation, relocation and whole unit refurbishment.

In fact, SERVCOM's reputation for quality service—customized to the way your company does business—has established SERVCOM as one of the leading independent service organizations in North America.

Now as part of $13 billion Alcatel, SERVCOM shares the technical, financial and professional resources to serve you and your business better than ever.

So take a close look at the comprehensive solutions Alcatel has to offer. When you do, you'll see what we mean by "Service in a whole new light."

ALCATEL

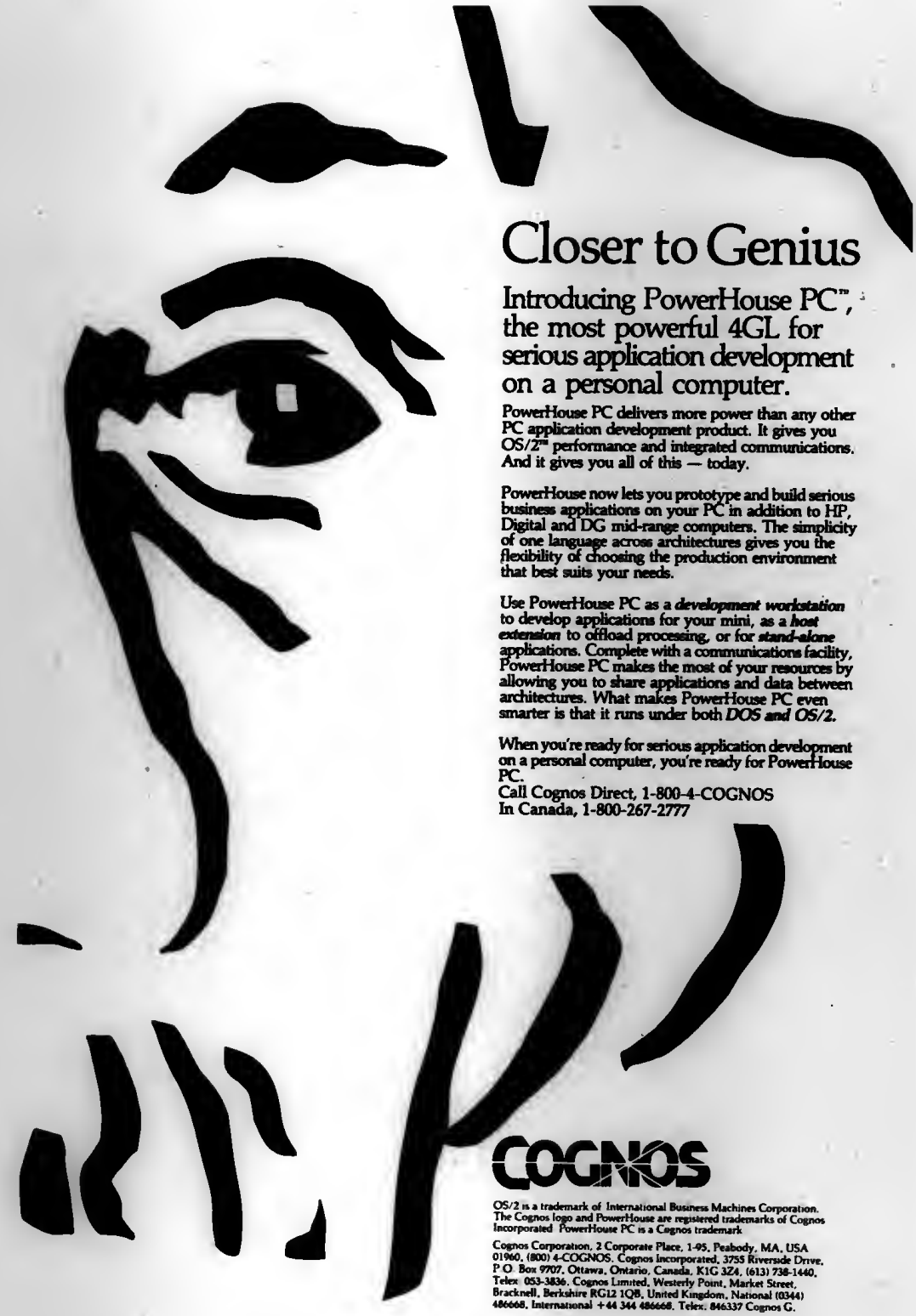
For more information on the Alcatel companies,
call 1-800-556-1234 (ext. 247) or in California 1-800-441-2345 (ext. 247);
or write Alcatel Business Systems, 1623 Buckeye Drive, Milpitas, CA 95035.

ALCATEL QUME
Leading Manufacturer of Computer Peripherals

ALCATEL SERVCOM
Computer Maintenance and Support Services

ALCATEL XTRA BUSINESS SYSTEMS
High Performance Single and Multiuser Computers

*Formerly Apparatus Division of ITT Telecommunications.
**Formerly ITT Business Communications Corporation and Thomson CSF Operations.



Closer to Genius

Introducing PowerHouse PC™, the most powerful 4GL for serious application development on a personal computer.

PowerHouse PC delivers more power than any other PC application development product. It gives you OS/2™ performance and integrated communications. And it gives you all of this — today.

PowerHouse now lets you prototype and build serious business applications on your PC in addition to HP, Digital and DG mid-range computers. The simplicity of one language across architectures gives you the flexibility of choosing the production environment that best suits your needs.

Use PowerHouse PC as a ***development workstation*** to develop applications for your mini, as a ***host extension*** to offload processing, or for ***stand-alone*** applications. Complete with a communications facility, PowerHouse PC makes the most of your resources by allowing you to share applications and data between architectures. What makes PowerHouse PC even smarter is that it runs under both ***DOS and OS/2.***

When you're ready for serious application development on a personal computer, you're ready for PowerHouse PC.
Call Cognos Direct, 1-800-4-COGNOS
In Canada, 1-800-267-2777

COGNOS

OS/2 is a trademark of International Business Machines Corporation. The Cognos logo and PowerHouse are registered trademarks of Cognos Incorporated. PowerHouse PC is a Cognos trademark.

Cognos Corporation, 2 Corporate Place, 1-95, Peabody, MA, USA 01960, (800) 4-COGNOS. Cognos Incorporated, 3755 Riverside Drive, P.O. Box 9707, Ottawa, Ontario, Canada, K1G 3Z4, (613) 738-1440, Telex 053-3836. Cognos Limited, Westerly Point, Market Street, Bracknell, Berkshire RG12 1QB, United Kingdom, National (0344) 486668, International +44 344 486668, Telex: 846337 Cognos G.

CIO

FROM PAGE 19

and mind-sets. MIS executives are technicians first and foremost. They lack the training and flexibility to move into business planning and the analytical faculties that would lead to a CIO-type position.

I would warn most MIS executives that unless they are able to discuss the information function from an investment point of view, unless they can use new approaches to encourage an understanding of the value of the information function and unless they develop credibility as a business person, they will not be called when the CEO decides the company needs a CIO.

I WOULD warn most MIS executives that unless they . . . develop credibility as a business person, they will not be called when the CEO decides the company needs a CIO.

The decision to name a top-level information executive must originate and come down from the top. For example, DuWayne Peterson is clearly part of top management at Merrill Lynch & Co. As executive vice-president of systems and operations, Peterson oversees a budget of about $1 billion.

The critical issue, Peterson says, is that the "perception of and desire for a CIO must come down from the CEO or COO, not pushed up by self-serving hype from MIS types."

He says the firm must come to the decision that the top information executive, with whatever title, most get more involved in planning and management.

Darwin John, vice-president of information services at Scott Paper Co., suggests that "what is essential is that information and related technology be aligned with the purpose and mission of the enterprise as a critical factor in fulfilling that mission and realizing the purpose."

Darwin adds, "If information and related technology, as a critical factor, are appropriately positioned, then the structure and associated reporting relationship should follow naturally."

We received comparable comments deploring the CIO title and emphasizing the need for a working relationship from Dudley Cooke, general manager of the information systems division of Sun Co.

Cooke goes so far as to advise measuring the "noise level" regarding a company's information systems function: "A high noise level generally would indicate excessive conflict and lack of the necessary partnerships and working relationships. Naturally, the bottom-line criteria is always results. If the organization is not achieving the business results desired, then they are failing."

A candidate for a CIO position, whether from within the organization or from the outside, is assumed to be competent not just in technology and management but in overall knowledge of the given business. The qualities being sought are difficult to define, but the best description of them is "fit."

Does the candidate understand the style of the company? Will he or she pick up on signals and be able to work within the bounds of a particular political environment? Is the candidate a team player or is he likely to claim turf within the corporation? Does the candidate mix in at the senior level?

There are other lessons to be drawn from these survey responses. The vice-president of MIS who seeks to become a CIO should seek to function like an investment banker rather than someone who needs to control his kingdom.

For instance, instead of equipping the company's data center to handle the organization's maximum load, farm out routine tasks and let the supplier cope with fluctuations in activity.

In effect, the vice-president of MIS should start behaving like a CIO but avoid the aspiration to be one.

How to prevent a computer from becoming a paperweight.

The multi-functional capabilities of Symphony 2.0 make any PC more productive.

Your company has a great deal invested in microcomputing. And one of your major challenges is to optimize that investment.

Lotus® Symphony® enables your PC users to get the most out of their hardware, and themselves. It provides all the power and versatility today's busy managers need in their multi-faceted jobs.

In a single package, Lotus Symphony combines spreadsheet, word processing, graphics, database and communications, putting five key business tools at their fingertips.

For PC users that means it's easy to move from one application to another, and they only have to learn one program. For you it means just one package to evaluate, teach and support.

Unlike many integrated packages, the depth of each Symphony application is not sacrificed for the sake of integration. Each function is powerful enough to meet the user's growing computing needs. In fact, the Symphony spreadsheet is based on the same technology as 1-2-3,® the industry standard.

And Lotus Symphony includes macros and a sophisticated command language for custom applications.

Plus, the newest version of Symphony, Release 2.0, has no copy protection and includes many new features, such as enhanced database and word processing, a spelling checker and text outliner, and faster spreadsheet performance.

So, don't let the potential of your PCs go unfulfilled.

Let Lotus Symphony help you get the most out of your investment.

© 1988 Lotus Development Corporation. Lotus, Symphony and 1-2-3 are registered trademarks of Lotus Development Corporation.

Lotus Symphony 2.0

Why We Don't Have The Time Or Money For A Quality Control Department.

How can a software company without a "quality control department" achieve an unsurpassed record of user satisfaction?

How can it *possibly* gain a reputation for supplying the finest financial application software packages available?

Simple.

We make quality control every employee's responsibility. Not just that of a single department.

The result? Our mainframe applications are so well designed, so thoroughly developed, and so painstakingly tested every step of the way that quality is guaranteed.

Before it leaves the company.

No beta test sites.

No hasty withdrawals from the market.

No disillusioned customers.

Our research and development team is committed to developing and refining the mainframe financial software that is the standard by which other systems are judged.

They make sure our systems are easy to install and easy to use. And, when a customer does need help, our support staff is on call 24 hours a day.

Another reason we are so successful is that, unlike other companies, we don't balk at giving prospective customers a *complete* customer list. We invite them to ask anyone on it how happy they are with our systems. And our people.

Hundreds of FORTUNE 1000 customers already rely on Data Design for quality software. Companies like Alcoa, Burger King, Greyhound, Pillsbury, Bankers Trust, CONTEL, General Electric, Chicago Tribune Company, and Security Pacific Bank.

In fact, 68 percent of our customers previously purchased systems from other, larger vendors—ones with the time and money to invest in a quality control department.

If you are evaluating software for your company, send for a free comprehensive guide designed to make your software selection process easier.

To find out how our systems work for a broad range of medium to large companies on most major computer systems, call Betty Fulton toll-free at **800-556-5511**, or mail in this coupon. We'll help you redefine quality.

Please send me information on the following:

- ☐ GENERAL LEDGER & FINANCIAL CONTROL
- ☐ ACCOUNTS PAYABLE & PURCHASE ORDER CONTROL
- ☐ FIXED ASSET ACCOUNTING
- ☐ PROJECT ACCOUNTING
- ☐ FREE SOFTWARE SOLUTIONS KIT

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY, STATE, ZIP _____

TELEPHONE ( ) _____

COMPUTER BRAND _____ MODEL _____

CWD

DATA DESIGN ASSOCIATES

Excellence in financial software.

1279 Oakmead Parkway, Sunnyvale, CA 94086

...terworld?

...et your own — You deserve it!

YES! I want my own subscription to COMPUTERWORLD. I'll pay just $44 for 51 weekly issues — that's only 86¢ per copy. In addition, I'll receive 12 FREE issues of COMPUTERWORLD FOCUS.

FIRST NAME | M.I. | LAST NAME

TITLE

COMPANY

ADDRESS

CITY | STATE | ZIP

Address shown: ☐ Home ☐ Business

For faster service call 1-800-255-6286! In NJ call 1-800-322-6286.

Canada, Central America & South America $110/Europe $165 All other countries $245 (Airmail)
Foreign orders must be prepaid in U.S. dollars

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS INDUSTRY** (Circle one)
   30 Manufacturer (other than computer)
   60. Finance/Insurance/Real Estate
   60. Medicine/Law/Education
   60. Wholesale/Retail/Trade
   30. Business Service (except DP)
   30 Government — State/Federal/Local
   65. Communications Systems/Public Utilities/Transportation
   20 Mining/Construction/Petroleum/Refining/Agric
   90. Manufacturer of Computers Computer-Related Systems or Peripherals
   60. Computer & DP Services including Software/Service Bureau/Time Sharing/Consulting
   60. Computer/Peripheral Dealer/Distributor/Retailer
   75. User Other _____
   90. Vendor Other _____ (Please specify)
2. **TITLE FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   19 Vice President Asst VP
   21 Dir Mgr Supv IS/MIS/DP Services
   63. Dir Mgr Supv of Operations Planning Adm Services
   23. Dir Mgr Supv Analyst of Systems
   31 Dir Mgr Supv of Programming
   32. Programmer Methods Analyst
   33 Dir Mgr Supv OA/WP
   39 Data Comm Network/Systems Mgt
   OTHER COMPANY MANAGEMENT
   11 President Owner/Partner General Mgr
   12. Vice President/Asst VP
   13. Treasurer Controller Financial Officer
   41. Engineering Scientific R&D Tech Mgr
   51 Sales/Mktg Mgt
   OTHER PROFESSIONALS
   60. Consulting Mgt
   30 Medical Legal Accounting Mgt
   30 Educators Journalists Librarians Students
   90. Others _____ (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user vendor or consultant
   A. Mainframes/Supermins
   B. Minicomputers/Small Business Computers
   C. Microcomputers/Desktops
   D. Communications Systems
   E. Office Automation Systems
   F. No Computer Involvement

348820-2

...terworld?

...et your own — You deserve it!

YES! I want my own subscription to COMPUTERWORLD. I'll pay just $44 for 51 weekly issues — that's only 86¢ per copy. In addition, I'll receive 12 FREE issues of COMPUTERWORLD FOCUS.

FIRST NAME | M.I. | LAST NAME

TITLE

COMPANY

ADDRESS

CITY | STATE | ZIP

Address shown: ☐ Home ☐ Business

For faster service call 1-800-255-6286! In NJ call 1-800-322-6286.

Canada, Central America & South America $110/Europe $165 All other countries $245 (Airmail)
Foreign orders must be prepaid in U.S. dollars

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS INDUSTRY** (Circle one)
   10. Manufacturer (other than computer)
   60. Finance/Insurance/Real Estate
   30. Medicine/Law/Education
   40. Wholesale/Retail/Trade
   30. Business Service (except DP)
   60. Government — State/Federal/Local
   65. Communications Systems/Public Utilities/Transportation
   75. Mining/Construction/Petroleum/Refining/Agric
   90. Manufacturer of Computers Computer-Related Systems or Peripherals
   60. Computer & DP Services including Software/Service Bureau/Time Sharing/Consulting
   20. Computer/Peripheral Dealer/Distributor/Retailer
   75. User Other _____
   90. Vendor Other _____ (Please specify)
2. **TITLE FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   19. Vice President Asst VP
   21 Dir Mgr Supv IS/MIS/DP Services
   63. Dir Mgr Supv of Operations Planning Adm Services
   63. Dir Mgr Supv Analyst of Systems
   31. Dir Mgr Supv of Programming
   32. Programmer Methods Analyst
   60. Dir Mgr Supv OA/WP
   60. Data Comm Network/Systems Mgt
   OTHER COMPANY MANAGEMENT
   11 President Owner/Partner General Mgt
   12. Vice President/Asst VP
   13. Treasurer Controller Financial Officer
   41. Engineering Scientific R&D Tech Mgr
   51 Sales/Mktg Mgt
   OTHER PROFESSIONALS
   60. Consulting Mgt
   75. Medical Legal Accounting Mgt
   60. Educators Journalists Librarians Students
   90. Others _____ (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user vendor or consultant
   A. Mainframes/Supermins
   B. Minicomputers/Small Business Computers
   C. Microcomputers/Desktops
   D. Communications Systems
   E. Office Automation Systems
   F. No Computer Involvement

348820-2

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO 55 NEPTUNE, NJ 07754

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPARTMENT
P.O. Box 1565
Neptune, NJ 07754-9916

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO 55 NEPTUNE, NJ 07754

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPARTMENT
P.O. Box 1565
Neptune, NJ 07754-9916

SOFTWARE & SERVICES

SOFT TALK

Charles Babcock

DB2 speed documented

IBM has put on display figures for DB2 Version 2 that show geometric increases in transaction throughput.

It claimed rates of 186 per second for complex transactions, and 300 to 438 for simple transactions, compared with the maximum 123 transaction/sec. of DB2 Release 1.3.

What do these figures mean, particularly since IBM had previously hung its hat on transaction throughput in the neighborhood of 50 transaction/sec. with Release 1.3?

As Russell Donovan, IBM data base products marketing manager, explains, the 123 figure came from the maximum rate achieved with Release 1.3 on an IBM 3090 Model 600 running MVS/XA. The rate was achieved with 91.4% CPU utilization, a figure that reflects a laboratory benchmark rather than a production process in which systems in addition to DB2 would be making demands on the CPU. The figure of 52 transaction/sec. cited earlier for Release 1.3 reflected a benchmark on a smaller CPU, the 3090 Model 200.

The transaction involved was more complex than the debit/credit transaction that was used in the Tandem Computers Nonstop SQL benchmark, which was announced in March 1987. The IBM transac-

Continued on page 28

Joint CASE standard issued

'Third-generation' protocol integrates in-house, off-the-shelf software

BY NELL MARGOLIS
CW STAFF

Digital Equipment Corp. and Sunnyvale, Calif.-based Atherton Technology have joined forces to forge a standard for the integration of CASE tools, particularly in large-scale scientific and engineering projects.

The proposed standard is based on 2-year-old Atherton's flagship product, Software Backplane — possibly the first U.S.-based commercial implementation of a so-called integrated project support environment. It is a set of software capabilities that link off-the-shelf and in-house tools in addition to automating many of the control and coordination functions called into play in the larger software development projects.

The concept "is founded on some solid technology," said Vaughan Merlyn, chairman of Bellevue, Wash.-based CASE Research Corp., "and the fact that DEC has signed on signifies merit. I expect that others will climb aboard the bandwagon."

The proposed standard, according to Atherton Marketing Vice-President Alan Codkind, ushers in third-generation computer-aided software engineering.

High-level integration

This level of integration, Codkind said, reaches beyond first-generation CASE, in which isolated tools first automated structured analysis and design, and second-generation CASE, which addresses tool-to-tool interfacing and the integration of front-end CASE design functions with back-end code generation and maintenance.

As a first step toward establishing the Software Backplane standard, DEC and Atherton announced at CASE Expo, held in Dallas earlier this month, that DEC will support Atherton's integration of the DEC Vaxset CASE tool kit and the VAX Ada compiler into the Software Backplane.

Simultaneously, Atherton will port the Software Backplane, which already runs under DEC's VMS, to Ultrix, DEC's version of the Unix operating system.

Pro-standard sentiment runs strong in an area otherwise faced with a plethora of incompatible tools shunned by buyers and unavailable to users — so much so that the rise in CASE standards proposals is beginning to mimic the rise in CASE product introductions.

In fact, several of the ranking standard-bearers are set to meet at the CASE '88 conference in Cambridge, Mass., in July to coordinate their efforts.

The DEC-Atherton integrated project standard, according to Codkind, complements rather than contradicts two current standardization efforts that are garnering increasing support: the electronic design interchange format standard and the Information Resource Dictionary System proposal, which is still hovering on the brink of official ANSI standard status.

Early indications are that the DEC-Atherton proposal, whether or not it eventually takes shape as a standard, will receive serious attention.

The list of CASE users, vendors and research organizations that sent representatives to hear and discuss the proposal in Dallas and who now have DEC-Atherton white papers under review include the following companies: Cadre Technologies, Inc., Hewlett-Packard Co., IBM, Index Technology Corp., Interleaf, Inc., RCA Corp., Rockwell International Corp., the Software Engineering Institute and the Software Productivity Consortium.

Both Apollo Computer, Inc. and Interactive Development Environments were unable to attend the Dallas conference but are members of the review group, according to Codkind. Sun Microsystems, Inc. has subsequently joined the effort.

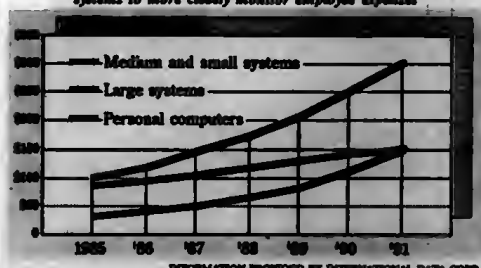
Inside

- Aion change control features enhance ADS expert system shell. Page 28.
- Pecan introduces job accounting software for IBM MVS and DOS/VSE environments. Page 30.

Data View

Small systems grab human resource jobs

Users are pushing payroll and personnel software onto smaller systems to more closely monitor employee expenses



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

Cincom embraces Fujitsu

CINCINNATI — Cincom Systems, Inc. and Fujitsu Ltd. of Japan have teamed up to tailor Cincom's data base management system and related products to the Fujitsu environment, the companies announced last week.

The technical cooperation agreement will cover Supra, Cincom's DBMS; Mantis, its application development system; and Net/Master, its network management product.

Those products currently run on Fujitsu hardware in certain overseas markets. The agreement is intended to provide future cooperation between the companies.

For instance, Fujitsu will work more closely with Cincom in releasing new versions of its operating system so that Cincom can make any necessary modifications to its software products in a timely fashion, the Cincom spokesman said.

Fujitsu, in turn, has the option of pitching IBM alternative software to its customers.

The agreement specifically covers four overseas markets: Japan, Australia, New Zealand and Hong Kong.

otlight

Wouldn't it be nice to have a couple more terminals on your desk?

You could eliminate the inconvenience, lost productivity, and system overhead associated with logging off and on to different applications!

BIMWNDOW permits multiple terminal sessions to be active concurrently at the same physical 3270 CRT, under DOS or OS VTAM. The user may switch back and forth instantly between the terminal sessions by hitting a PA or PF key. The terminal sessions may be in the same or in different VTAM-connected partitions/regions. For example, one session might be logged on to a CICS partition or to TSO to do program editing, and another session connected to a test CICS to test the application program being developed.

Now with 3270 data compression built in!

Call for full documentation or free 30-day trial.

Price: OS — $5800 or $280/mo., DOS — $2800 or $140/mo.

BIM has 15 system software products for improving productivity and use of DOS/VSE, OS, and CICS, and also performs systems programming consulting. Marketing agents in most countries.

BIM INC. 612-933-2885
Telex 297 693 (BIM UR)
Member Independent Computer Consultants Assn

VAX retrieval system eases searches

BY NELL MARGOLIS
CW STAFF

ROCKVILLE, Md. — CC Software, Inc. is seeking to lower human I/O barriers with a Digital Equipment Corp. VAX-based text retrieval system that lets users search a wide variety of texts quickly, easily and relatively inexpensively, according to company claims.

Available immediately, CC Search is a software tool that can be used to index — and, thereafter, search for and retrieve —not only documents but program source code, electronic mail messages and technical documentation, according to Vice-President Paul Rosenbaum.

Such flexibility, he said, suits the software to tasks as varied as finding the applicable law on a given issue and tracking clients or competitors.

CC Search goes easy on both users' abilities and system resources, said Richard Marino, company founder, president and product developer. "Comparable products such as [Information Dimensions, Inc.'a] Basis were designed for professional users and rely on their knowledge of commands," Marino claimed. Not so CC Search, which was designed for many occasional users rather than a small group of constant ones. The product has about a dozen commands altogether, although the company said a typical user will need about six.

The CC package takes up less than 8M bytes of disk space and does not require either installation of special images or multiple processes, Rosenbaum said. Because the software reads many DEC VMS file types directly, the need for translating files and, consequently, indexing time and disk space requirements, are greatly reduced, he pointed out.

CC Search now reads variable and fixed-length RMS sequential files and Technical Information Systems, Inc. LEX-11 or Wordperfect Corp. Wordperfect documents. Support for DECDX, Microsystems Engineering Corp.'a Mass-11 and Data Processing Design, Inc.'a Word-11 documents is promised during the next several months, Rosenbaum said.

Because the software lets users create indexes with pointers to original source files, from which text is then displayed or printed, he added, disk space requirements are further minimized.

Initial license prices for CC Search range from $3,000 to $29,500, depending on CPU; the vendor said discounts for secondary licenses, clusters and government and educational organizations are available.

Goal ships VM security package

COLUMBUS, Ohio — Goal Systems International, Inc. recently began shipping an upgraded version of its security software for the IBM VM operating system.

Alert/VM Version 2.03 is said to combine security maintenance functions with the VM operating system's directory maintenance functions. With this integration, separate updates are no longer required, the company said.

The directory maintenance functions now folded into Version 2.03 include integrity checking during minidisk allocation, which was designed to prevent accidental overlays; synchronization between Alert/VM security definitions and VM directory entries; a mass-update function that allows for the addition or update of a large number of users; and a full-screen, menu-driven directory of management functions that eliminates the use of directory maintenance command syntax.

Version 2.03'a new security features include processing restrictions based on an account identification as well as user and group identification.

Alert/VM is priced at $16,000 and supports VM/SP or VM SP High Performance Option Release 3 or higher, the vendor said.

Kit simulates System/38

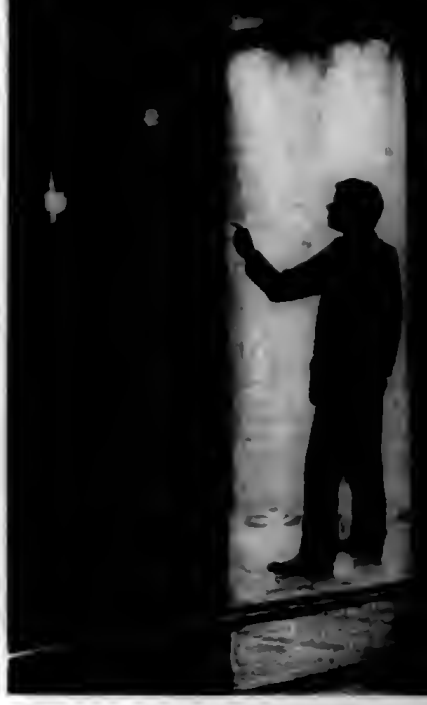
WOODBURY, N.Y. — Triangle Computing Corp. recently released a programmer's kit for the IBM System/36 that it said enables users to simulate an IBM System/38 environment.

Q-Pgmr was designed for System/38 users preparing to upgrade to either the System/38 platform or to the expected IBM follow-on known as Silverlake, the company said. IBM has said its follow-on mid-range system will combine features from the System/36 and 38.

The tool allows programmers to write code in the traditional System/36 mode using the RPG-II language. However, Q-Pgmr provides System/38 Data Definition Specification file descriptions. A programmer can use these to create externally described files on the System/36, the company said.

The tool has a license fee of $750.

THE INTELLIGENT



You Take The Spotlight,

While you are out in the spotlight giving it your all, you can't afford to worry about your communications network support.

At Tymnet McDonnell Douglas, worry-free service is our specialty.

We have two decades of experience — we were the first public data network, in fact, and are one of the world's largest private network suppliers — helping large and small corporations and government agencies to take the spotlight by offering cost-effective, comprehensive, reliable communications services, so they can concentrate on their businesses rather than on networking worries. For hundreds of Fortune 500 companies and government agencies, we offer:

- maximum flexibility, with a software-based approach that enables simple, inexpensive upgrading and modification; unmatched protocol conversion capabilities; and the largest variety of dial-up access speeds (up to 9600 bps)

INTERNATIONAL
COMMUNICATIONS
ASSOCIATION
TYMNET/ICA BOOTH #2080

SOFTWARE NOTES

Computer Data to acquire Group Operations

Group Operations, Inc. in Washington, D.C., has signed a letter of intent to be acquired for $3.5 million by **Computer Data Systems, Inc.**, a data processing consulting firm in Rockville, Md. Group Operations is a 90-employee, $5.5 million-a-year supplier of Cobol maintenance and restructuring tools, including Scan Cobol and Superstructure. It is privately held, according to Barry T. Murphy, vice-president.

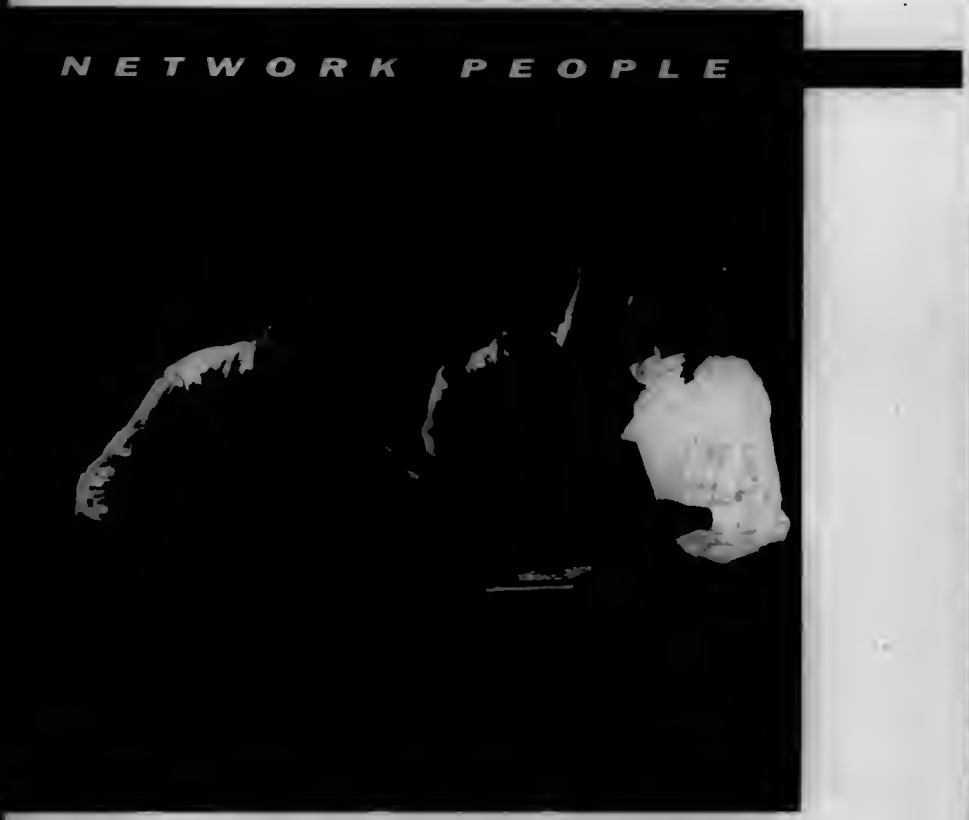
Although structured Cobol is a widely advocated goal and a feature of ANSI-standard Cobol 85, the Cobol structuring products have been in the marketplace for about three years. They have yet to catch on in a widespread fashion. Group Operations' chief competitors include IBM's Cobol Structure Facility, Language Technology, Inc.'a Recoder and the Catalyst Group of Peat, Marwick, Main & Co.'s Retrofit.

The score is five to four. **Bachman Information Systems, Inc.**, a young firm that provides tools for re-engineering existing systems, announced April 14 that it has opened four regional sales and support offices "in response to a widespread demand for its products." As it turns out, however, Bachman announced the existence of the offices three months ago, just as its product line was announced. It also said at the time there was a fifth office in Los Angeles that apparantly didn't survive to see the "widespread demand."

Frank Dodge, chairman of **McCormack & Dodge Corp.** in Natick, Mass., tacitly combatting any lingering notions that his company might be on the auction block, notes that M&D revenue was up 24% in 1987. He cannot say what they were, since parent Dun & Bradstreet Co. does not break down revenues by division, but the figure would represent a nearly $30 million increase over 1986's $123 million to $152 million.

Gold Hill Computers, Inc. in Cambridge, Mass., said it will port its expert system development tool to Sun Microsystems, Inc. workstations that are based on the Intel Corp. 80386 microprocessor. Goldworks is a menu-driven development and delivery tool for expert systems that has been offered on microcomputer platforms.

Joining Gold Hill in the move to the new Sun platform is **Cadre Technologies, Inc.** in Providence, R.I. The company will offer its Teamwork systems development tool in July at a cost of $7,500.



We'll Take The Worries.

- network management, including network monitoring, 24-hour customer service, and extensive nationwide local technical support
- unparalleled data security
- comprehensive network planning support for maximum communications effectiveness
- error-free communications

The Intelligent Network People at Tymnet have helped a cast of thousands to perform brilliantly. Take advantage of our experience; call and let us show you how we can help you to achieve worry-free communications.

Bring us behind the scenes with you... We'll make you a star.

Tymnet

2560 N. First Street
P.O. Box 49019
San Jose, CA 95161-9019

Call us at (800) 872-7654

We Build Networks.

MCDONNELL DOUGLAS

Focus accesses DEC VAX data

CINCINNATI — Information Builders, Inc. celebrated Dexpo East in February by announcing its Focus fourth-generation language data base management system's ability to write to Digital Equipment Corp.'a RMS files and VAX/VMS RDB relational data base.

Tomorrow at Dexpo East, Information builders plans to go itself one better by announcing complete read/write interfaces to the three leading third-party VAX-based relational data bases: Oracle Corp.'a Oracle, Relational Technology, Inc.'a Ingres and Sybase, Inc.'a Sybase.

While the new interfaces allow the user developing applications in Focus to go against a wide range of data files without regard to proprietary data base engines, Albert D'Andrea, Information Builders' VAX systems marketing manager, pointed out, a dictionary utility that is already part of the package links the accessed data to the Focus language, protecting the user's software investment.

The Oracle interface is available immediately, Sybase will be on board within the month and Ingres is coming in June, D'Andrea said.

A Unix interface that will give Focus users access to Informix Software, Inc.'s Informix is said to be under development.

The vendor said Focus Release 5.2 is priced from $6,800 to $155,700; read/write interfaces are priced from $1,695 to $18,925; and read-only interfaces, from $900 to $10,000, depending in all cases on CPU.

Protect PC Files

ARX lets PC users backup, restore and archive PC files to CICS, TSO or CMS.

ChicagoSoft

(312) 525-6400

Aion shell gains new facets

Expert system builder offers change control, cooperation

BY CHARLES BABCOCK
CW STAFF

PALO ALTO, Calif. — Aion Corp. has integrated change control features into Version 5.0 of its expert system-building shell, Aion Development System (ADS), and has provided a cooperative processing feature through an LU6.2 link.

The LU6.2 IBM Advanced Program-to-Program Communications link allows an expert system on an IBM Personal Computer to retrieve mainframe data and interact with an ADS knowledge base on the mainframe, according to Harry Reinstein, Aion president. Users of the previous release of ADS were able to develop systems on PCs for use on mainframes, but they were not able to cooperatively work with a PC expert system.

In addition to an IBM PC-DOS version, an OS/2 version of ADS is now available, Reinstein said.

ADS can work in the traditional mainframe environment with existing applications. ADS can access and make use of IBM DL/1, DB2, SQL/DS, QSAM and VSAM files. It also runs under IBM's VM/CMS or MVS with the TSO, CICS or IMS/DC teleprocessing monitors.

Set to be available in the fourth quarter, mainframe Version 5.0 will offer a change-auditing capability to track program changes in a team development environment or to existing, large applications, Reinstein said.

A programmer must still document why he made changes, but an automatic facility within ADS tracks which programmer made changes to which version of the application.

ADS is available at a price of $70,000 for MVS, $60,000 for VM and $7,000 on the IBM PC. An additional charge of $15,000 is levied for the CICS teleprocessing monitor or $25,000 for the IMS/DB DC monitor.

DESPERATELY SEEKING DASD?

CLUE #1

CLUE #2

CLUE #3

CW
BMC SOFTWARE
P.O. Box 2002
Sugar Land, TX 77487-2002

1-800-841-2031 in the U.S.A.
or 713-240-8800
1-800-231-2698 in Canada
(1) 48-77-77-77 in France
(02) 48193834 in Italy
(0276) 24622 in the United Kingdom
(069) 66 4060 in West Germany

☐ Contact me about a 30-Day-Plus Trial for DATA PACKER/VSAM
☐ Contact me with more information about DATA PACKER/VSAM

Name _____
Title _____
Company _____
Address _____
City _____ State/Prov. _____ Zip/PC _____
Telephone _____

Babcock

CONTINUED FROM PAGE 25

tion was derived from a survey of IMS customers; it uses a series of five transactions typical of inventory tracking and stock-control applications, according to a 205-page "Performance Report" on DB2 Release 1.2 from IBM's Santa Teresa, Calif., development lab.

With its mix of retrievals, insertions, deletions and updates, the IBM transaction more closely resembles the work load expected from a relational system than from the speed-oriented debit/credit transactions.

The same transaction set has been used to test subsequent releases of DB2, including Release 1.3 and Version 2, IBM officials said.

The 300 to 438 transaction/sec. range reflects testing with TP-1-type transactions — the debit/credit activity of tellers at a group of bank branches. The highest rates reflect very simple transactions, like a credit authorization, or those executed by an automatic teller machine, with a complete transaction consisting of two reads and an update.

It is interesting to note that in no instance does IBM refer to a particular result beingachieved with a TP-1 transaction, and therefore, the IBM results do not lend themselves to direct comparison with those of any other vendor.

It should also be noted that the benchmark was conducted on IBM's most powerful processor, the 3090 Model 600E, with the ESA operating system and 256M bytes of expanded storage — the maximum available. While no benchmark of Version 2 was conducted under MVS/XA, the ESA results are thought to be 12% to 13% higher than could be achieved under MVS/XA, IBM said.

While actual applications will invariably have slower transaction throughput than laboratory tests, both sets of results are significant because they represent IBM's attempt to put mainframe relational data base performance out in front of the crowd.

IBM is not being pressured by competitors to do this. Demonstrating a grasp of the intricacies of the mainframe environment will take time, and IBM isn't leaving a lot of time for dust to collect on its heels as it pushes relational data base forward.

Instead, IBM is trying to get in front of the demand for performance of its largest customers. Right now the customers' standard is IMS, and large, full-function IMS users tend to push 75 to 80 transaction/sec. through their systems. And thelargest IMS Fast Path customers, the money center banks, tend to require 178 transaction/sec., according to Jim Henderson, IBM director of application enabling software.

To be sure, IBM is solving the performance problem by shoveling hardware and software resources at it, and such performance will come with a hefty price tag. Instead of just looking at transactions per second, IBM customers might want to ask for the price per transaction per second. Nevertheless, IBM's method of measuring performance appears to be consistent across releases of DB2 since 1.2, and that means Version 2 represents a giant step forward.

Babcock is *Computerworld's* senior editor, software & services.

Many companies make RDBMSs, but

Only SYBASE meets all 5 demands of on-line applications.

SYBASE is the only field-proven SQL-based relational database management system (RDBMS) for high-performance on-line applications. SYBASE is uniquely designed to handle your business and mission critical applications on distributed VAX/VMS, SUN/UNIX, and Pyramid/UNIX systems with PC connectivity. And, this year, SYBASE will be available on OS/2 for work-groups. Phone to sign up for our *free* Seminar Program. Or use the coupon below to request a *free* Benchmark Kit. Any RDBMS that offers you less than these 5 capabilities, won't keep your applications on-line.

1 HIGH VOLUME PERFORMANCE

Benchmarks prove that SYBASE delivers exceptional transaction throughput with subsecond response time for large numbers of users. Its unique and advanced multi-threaded architecture eliminates operating system overhead, and handles peak load requirements with the leading cost efficiency of any RDBMS.

2 DATA INTEGRITY

SYBASE enforces data integrity rules, including *referential integrity* in the database rather than in each application. This reduces application development and maintenance time while dramatically improving protection and control of data consistency.

3 HIGH AVAILABILITY

SYBASE applications remain up and running during on-line backups, integrity rule changes, database design changes, and performance tuning. And SYBASE is the first RDBMS to provide software-based fault tolerance for continuous operation in spite of hardware failures.

4 DISTRIBUTED DATA MANAGEMENT

The SYBASE *client/server* architecture lets you transparently distribute applications and databases over multiple heterogeneous machines. SYBASE is first to provide a *two phase commit* protocol for distributed update transactions in a SQL-based RDBMS.

5 WINDOW-BASED TOOLS

SYBASE's pull-down menus, overlapping windows, icons, and point-and-pick interfaces increase both programmer and end-user productivity. SYBASE's integrated visual tools have a consistent look and feel across application development, forms management, data entry, query and reporting, and data administration. SYBASE applications fully exploit character terminals AND bit-mapped workstations without programming changes.

SYBASE

First in On-Line Applications

2910 Seventh Street • Berkeley, CA 94710 • 415 • 548 • 4500

SYBASE and the SYBASE logo are registered trademarks of Sybase, Inc. All other product and company names are

GET THE FACTS!

Mail this coupon along with your business card to Benchmark/Sybase, 2910 Seventh St., Berkeley, CA 94710. Your free Benchmark Kit will include information on: (1) How to evaluate RDBMS transaction processing benchmarks, and (2) SYBASE performance on the industry standard TPI benchmark as validated by an independent agency.

My hardware is: ☐ VAX/VMS ☐ SUN ☐ Pyramid ☐ Other _____

other system / release

NEW PRODUCTS

Applications packages

Trajectory Software, Inc. recently announced Lex PDQ, an updated version of the Lex series what-you-see-is-what-you-get word processing software with data base capabilities.

The latest release includes multiple font support, expanded Help screens, menus and horizontal scrolling. The product is said to run under Unix, Xenix, UTX/32, OS/32, DOS and other operating systems. Documents are saved as straight ASCII files, and Lex PDQ includes a calculator and a mass-mailing system, the vendor said.

Lex PDQ costs from $395 to $10,000, depending on operating system environment.

Trajectory Software, Suite 108, 555 Goffle Road, Ridgewood, N.J. 07450. 800-445-9292.

Adra Systems, Inc. has released Cadra-II 5.0, an upgraded version of its mechanical computer-aided design and drafting software.

Release 5.0 runs on the Adra 1000 and 3000 computer-aided design and drafting systems and has added flat-pattern development for sheet metal applications. The drawing overlay facility has been expanded to allow up to 200 drawings associated on a list. The package now supports the Ethernet Transmission Control Protocol/Internet Protocol networking standard.

Cadra-II 5.0 is free to existing users and will be shipped with all new systems.

Adra Systems, 59 Technology Drive, Lowell, Mass. 01851. 617-937-3700.

Computer Systems Development, Inc. is integrating its Cimplan package into its Impcon manufacturing software.

The Cimplan option extends Impcon capabilities into the design engineering phase, enabling transition from product design to manufacturing. The Cimplan integration allows users to manage engineering data, perform process planning and directly link to sales order processing and production control.

Impcon system capabilities include asset management, contract costing, bar coding, warehouse management and time and attendance tracking. Links to computer-aided design and business environments are also provided.

Impcon is priced from $30,000, depending on software configuration and CPU.

Computer Systems Development, 910 Boston Post Road, Marlboro, Mass. 01752. 617-460-0330.

Utilities

A job accounting package for the IBM MVS and DOS/VSE operating environments has been introduced by **Pecan Software Corp.**

Smart/JA uses bar charts, displays and calendars to display bottlenecks, CPU use and device work load. The product was designed to help systems personnel and upper management determine the work load balance between shifts and the average runtime per program.

A perpetual license for Smart/JA costs $7,500 for MVS and $4,500 for DOS/VSE.

Pecan Software, Suite 107, 419 Crossville Road, Roswell, Ga. 30075. 404-594-9707.

A productivity enhancement package for IBM TSO and CICS users has been announced by **Fischer International Systems Corp.**

Interactive Output Facility 6.0 allows users to review the status of batch jobs and sort job lists based on menu-selectable fields. The upgraded version reportedly analyzes job queue and spool-space use and includes display and track group analysis facilities. The product addresses data areas above the 24-bit line to provide 31-bit virtual storage relief.

Interactive Output Facility 6.0 costs from $3,600 for an annual lease.

Fischer International Systems, P.O. Box 9107, Naples, Fla. 33942. 800-237-4510.

Syncsort, Inc. has released Version 3.2 of its sort, merge and copy utility, Syncsort OS. The program was designed for IBM MVS and MVS/XA operating systems.

The upgrade reportedly has achieved significant performance improvements in both sort and copy applications.

Syncsort OS 3.2 costs $3,400 per year for a three-year lease, which includes all maintenance and future upgrades.

Syncsort, CN16, 50 Tice Blvd., Woodcliff Lake, N.J. 07675. 201-930-9700.

Services

Unisys Corp. has introduced the U Series Starter Plan, an extension of its Customcare service said to enhance productivity on Unisys U 5000 and 6000 hardware running the Unisys System V operating system.

The integrated service package gives customers access to Unisys technical expertise throughout the hardware and system software installation process. The plan includes an initial customer review of the actual order, software levels, system hardware, operating system software and a post-installation session.

Unisys, P.O. Box 500, Blue Bell, Pa. 19424. 215-542-2244.

With Lawson business application software... Superheroes like you wear PINSTRIPE® suits

Choosing business application software can be a heroic effort. Your end-users want super, easy-to-use application features. Your data processing staff insist on simple installation, clean code and software that's easily maintainable.

Your boss is looking at the bottom line. He wants a tool to increase productivity. To lead to better business decisions. And make him look good.

A Herculean order.

But so easily attainable. Lawson provides sensible PINSTRIPE® business software for your accounting, human resources and procurement/distribution management applications. On your IBM Mainframe, IBM System/38 or Unisys (Burroughs) equipment.

Full-featured design.
PINSTRIPE® application software is designed by people like accountants, CPAs and human resource professionals on our staff. So your end-users get all the easy-to-use features they need.

And features they never thought they could get. Until they asked us. In the last four years, we've incorporated 84 percent of all end-user suggested enhancements into our software packages.

PINSTRIPE® packages are tightly integrated with each other by design, too—for more efficient use of company data. Building powerful systems for business decision-makers.

New software technology.
Lawson offers the best in software technology. Our code is fresh. Straightforward. For simple installation and maintenance. Matter of fact, our packages are completely updated and rewritten about every three years. So you're not "patched" to death with a cumbersome and unwieldy system. Instead, you take full advantage of industry advancements in both hardware and software technology. For improved productivity.

And we offer new systems software tools to simplify and streamline program operation in your hardware environment. Easy install, for instance, speeds installation—up to ten times. Saving time for both MIS *and* end-users.

Service and support—whatever it takes.
And it's all backed by service and support that set a new benchmark for the industry. With excellent standard service and maintenance that gets you up and running fast with your PINSTRIPE® package. Including your own personal client service representative. Who will be familiar with your particular application—and the package.

Plus a full range of optional Support-Plus services. Like implementation consulting, data conversion, application and technical consulting. A post-sale audit to make sure you're fully—and profitably—implemented. And more.

If you have some unique needs, we'll adjust our package to fit. And guarantee our work. Rather do your own modifications? You'll find our well-structured code easy to modify. And we'll still support the rest of the package. Other business application software companies won't.

Be a Superhero—with Lawson PINSTRIPE® software.
Feature-rich application technology. State-of-the-art software technology. Plus service and support that set a new industry standard. At Lawson, we put it all together.

Call us toll free at 1-800-672-0200, and we'll send you our Executive Overview. Plus our useful booklet on how to select application software.

So you can be the superhero in your company.

Lawson Associates Inc. provides a full range of richly featured PINSTRIPE® business application software packages. For IBM System/38, IBM Mainframe and Unisys (Burroughs) hardware environments. Available in the U.S., Canada and overseas.

Accounting
• General Ledger • Accounts Payable
• Accounts Receivable • Fixed Assets
• Project Accounting

Human Resources
• Payroll • Personnel • Benefits

Distribution/Procurement Management
• Order Entry • Inventory Control
• Purchase Order

LAWSON

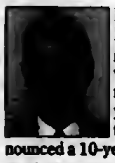
...WHATEVER IT TAKES!

LAWSON ASSOCIATES INC.
2021 East Hennepin Ave., Minneapolis, MN 55413
1-800-672-0200

MICRO BITS

Douglas Barney

Lotus, IBM guard 'secret'



Lotus and IBM: What gives, anyway? It was more than a year ago that Lotus and IBM announced a 10-year joint development agreement that called for an IBM 370 version of Lotus's 1-2-3 as well as a joint exploration of SQL data base management system technology. The vaguely worded agreement was hailed as a turning point for Lotus; a sort of end to software puberty.

On a regular basis, ever since that announcement, we have asked executives and spokesmen from both companies exactly what the agreement calls for besides a mainframe spreadsheet. What is going on with this DBMS stuff, a market Lotus and IBM seem to be attacking separately? Does the agreement mean Lotus will support OS/2 Extended Edition's Database Manager, or will IBM support Lotus/DBMS?

Well, the questions have been asked and answered with a resounding "No comment," "Stay tuned" or "Ask IBM."

The uncertainty has gone on for so long that you may be asking yourself, What agreement?

So what is the big secret?

Continued on page 41

Putting OS/2 in the big picture

IBM plans for Extended Edition evolution; users still won't commit

BY DOUGLAS BARNEY
CW STAFF

OS/2 Extended Edition may be the cornerstone of IBM's distributed data base and Systems Application Architecture (SAA) strategies, but so far, few users are set to embrace it and only one software vendor has pledged application support.

But the apparent lack of vendor support and user implementation plans has not curtailed IBM's own ambitions for the sophisticated product, which sells for $725 and is being prepped to ship this summer.

For IBM, OS/2 Extended Edition's relational DB2 syntax-compatible data base management system and broad communications capability is where both SAA and distributed data base begin.

Although the first release of OS/2 Extended Edition will include only a stand-alone data base, during the next four years, the system will evolve into a full-fledged distributed data base environment that cuts across microcomputer, minicomputer and mainframe architectures, according to an IBM official.

In addition, the system will eventually support nonrelational DBMSs as part of its distributed data base architecture, said Dick Kamerer, OS/2 Extended Edition senior planner at IBM's Entry Systems Division.

Development path

That evolution, based on SAA, will occur in four steps, according to Kamerer. The initial step will be the single-user system set to ship in two months. But by next year, IBM will have added so-called remote data services to provide two capabilities: data base server features and the ability to distribute data across workstations and servers on a local-area network.

And within two years, IBM will have added the ability to mix and match data from relational DBMSs on mid-range and host systems. However, to obtain true multisite read and update capability, the individual application vendors must support the IBM approach, Kamerer said.

The final step, which will not be realized for four years, is bringing nonrelational data base systems into the distributed data base equation. For this to succeed, software vendors must fully conform to SAA guidelines. "Bear in mind this is an SAA solution. If you don't participate in

Continued on page 46

Rest in peace, 3270 PC

BY ALAN J. RYAN
CW STAFF

IBM did not rattle any cages when it announced it had stopped building its 3270 Personal Computer line; some even labeled the announcement a cause for celebration.

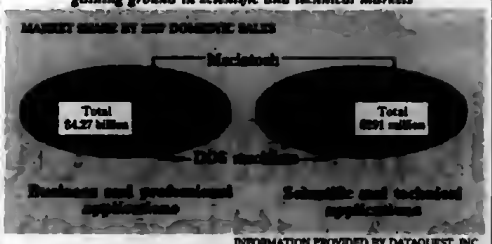
The product line's history was marred by lackluster sales and questionable advantages, especially the G model graphics terminals. By year-end 1987, there were only about 40,000 3270s installed worldwide, according to Brian Jeffery, managing director of the International Technology Group in Los Altos, Calif.

Continued on page 43

Data View

DOS vs. underdog

Although DOS still dominates, Apple's Macintosh environment is gaining ground in scientific and technical markets



INFORMATION PROVIDED BY DATAQUEST, INC.
CW CHART

Delay plagues Wordstar

BY STEPHEN JONES
CW STAFF

SAN RAFAEL, Calif. — Just when Micropro International Corp. seemed to be getting a leg up on a few of its problems, something came along to knock it right back down again. The most recent trouble involves its flagship word processing package, Wordstar.

Shipment of Wordstar Professional Release 5, the company's long-awaited Wordstar upgrade, was delayed from mid-May to early summer because of development problems, according to company officials. Analysts have said Micropro needs to score soon with a new Word-

Continued on page 43

Inside

- Reviews of Turbo Basic, Pertmaster, 4Views. Page 33.
- Lanar develops PC XT-compatible data acquisition computer. Page 35.

Excelerator Micro Focus COBOL/2 Workbench

... from design to tested code

Analyze, design, develop, compile and test mainframe or microcomputer COBOL applications in an integrated workstation environment with our Excelerator Interface.

The Interface converts system designs from Index Technology's Excelerator systems analysis and design software into structured skeletal COBOL source code that can be refined using the Micro Focus® COBOL/2 Workbench™ programming environment. Previously, integrated support for all stages of COBOL application development required the use of mainframe systems.

Outstanding benefits and features:

- Conversion of structure charts into skeleton COBOL programs which can be used within COBOL/2 Workbench
- Translation of Excelerator data records, elements, screens and reports into COBOL data descriptions, screen maps and report layouts by Micro Focus screen and report formatters
- Creation of usable PC and mainframe COBOL code, plus BMS and MFS assembler macros
- Increased productivity by automating the tedious work of coding screen, report and record layouts
- Reduced mainframe utilization by using PC workstations across the systems development life cycle
- Reduced coding errors by enhancing communication between users, analysts and programmers
- Can be invoked from the Micro Focus COBOL/2 Workbench or DOS command line

Compile and Run Huge CICS and IMS Programs:

After you create programs, test them with the CICS or IMS Option for COBOL/2 Workbench and put s mainframe on your desktop! Take advantage of the extended memory option on your PC/AT or PS/2 to test programs with Data and Procedure Divisions of up to 16 MB with XM.

COBOL/2 Workbench is a unique system of software tools for maintaining, creating, testing and running advanced COBOL programs on PCs. The Excelerator Interface option greatly enhances its usability for mainframe programmers.

For the most efficient development of either your PC or mainframe programs, call us now.

1-800-872-6265

U S: 2465 E. Bayshore Road
Palo Alto, CA 94303
(415) 856-4161

U K: 26 West Street
Newbury, Berkshire RG13 1JT
(0635) 32646

MICRO FOCUS®

A Better Way of Programming™

Excelerator ® is a registered trademark of Index Technology Corporation.

Does Your Application Development Future Seem A Little Cloudy?

Don't be confused by all the information that is floating around on application development. Attend our upcoming free seminar series, "Future Trends in Application Development Technology," and you'll get a more thorough, down-to-earth picture on how to solve your present and future needs.

Shaku Atre, an internationally renowned expert on application development technology and end-user computing, will discuss "The Implications of CASE within SAA" and "The Business Value of CASE Technology" during these full-day sessions. You'll get a detailed analysis of SAA as defined by IBM® and its impact on your organization, as well as an overview of the immediate productivity and financial benefits to be gained from CASE. Hear success stories first-hand from users of MANTIS®, Cincom's application development language, and take part in on-line demonstrations of MANTIS and CASE technologies.

Our Seminar Series With Shaku Atre Will Help Clear The Air.

6/21 Montreal	*6/29 Dallas*
6/22 Boston	*6/30 Cincinnati*
6/23 New York	*7/6 San Francisco*
6/24 Philadelphia	*7/7 St. Louis*
6/28 Houston	*7/8 Chicago*

All of which can help you clear the air about what's available and put together a more solid solution for the years ahead.

Don't miss your chance to take part in these valuable seminars. Space is limited, so call now to reserve your seat.

1-800-543-3010

In Ohio, 513-661-6000
In Canada, 1-800-387-5914

CINCOM

The Better The Solution, The Better The Value.™

IBM is a registered trademark of International Business Machines Corporation. © 1988 Cincom Systems, Inc.

REVIEWS/NEW PRODUCTS

Souped-up Turbo Basic quick off the line

Borland International's Turbo Basic Version 1.1 is typical of what we have come to expect from the company's languages. It is a compact, fast, easy-to-use programming environment that lets you produce programs quickly and compile them for immediate use.

Features: Turbo Basic 1.1's top-line menu offers file, edit, compile, run, debug, window and environment options. You can create your program in the Edit window using commands similar to those in early versions of Micropro International Corp.'s Wordstar. The editor works strictly on text; it does not check syntax or the spelling of command statements. Lines are limited to 250 characters including the carriage return.

Other features include a search and replace function; the capability to see what your program will look like when it is run as a free-standing, full-screen program; and the capability to view the current program's line number or label, procedure and function name as it executes. You can also choose to compile your program to memory, or to an .EXE or chain file.

Turbo Basic provides many extensions to the Basic language, including an assembly language interface. However, experienced Basic programmers will find that some of Turbo Basic's statements and commands work differently from the way they do in interpreted Basic.

Performance: Very good. Turbo Basic requires 320K bytes of random-access memory, IBM PC-DOS or Microsoft Corp. MS-DOS 2.0 or higher and one floppy disk drive. The 27K-byte, 924-line program we used contained almost every Basic command and statement except those relating to music and graphics.

Overall, we have no complaints. We were especially pleased with Turbo Basic's superior control structures and its many extensions.

Turbo Basic's handicaps are not critical. You cannot continue a program after stopping it during the run process. Also, the compile operation stops at the first error it finds. After editing, you have to recompile the program from the beginning.

Turbo Basic allows immediate compilation

Turbo Basic Version 1.1

Price: $99.95

- Performance: Very good
- Documentation: Very good
- Ease of learning: Very good
- Ease of use: Excellent
- Error handling: Good
- Support: Very good
- Value: Very good

Documentation: Very good. Borland's reference manuals are easy to follow and provide excellent examples.

The Turbo Basic manual is dominated by a reference section explaining each command and statement. The table of contents is comprehensive, and the index is extensive. Appendixes include a DOS primer, data on the assembly language interface and a comparison of Turbo Basic and interpreted Basic.

Ease of learning: Very good. No programming language is easy to learn if it is your first, but if you already know something about Basic, Turbo Basic should not give you too much trouble.

The context-sensitive Help screens are focused on the use of Turbo Basic rather than on programming, but the sample programs provide a solid basis for play and practice.

Ease of use: Excellent. At any moment all of Turbo Basic's capabilities are just a few keystrokes away. Also, the menu command line is implemented logically and simply. The multiple windows for editing, running, tracing and debugging are a boon to productivity.

Error handling: Good. Turbo Basic's error handling during compilation falls short. The fact that changes to the program require recompilation and that only the first error detected is reported to the programmer during compiling can lead to time-consuming edit-compile-edit-recompile sequences. However, the compiler did find every deliberate syntax error entered.

Support: Very good. Turbo Basic comes with a 60-day warranty. Borland's technical support number is not given in the manual, but a phone call to the main number gets you through to support. The technical staff members were friendly, responsive and knowledgeable.

Value: Very good. Turbo Basic and Microsoft's Quick Basic are head-to-head and toe-to-toe competitors. Choosing an outright winner in this battle is impossible.

Contrasting them, we would say that Quick Basic has a slight edge in performance; however, Turbo Basic's simpler structure makes it slightly easier to use.

Note

Reviews are provided by the IDG News Service.

Pertmaster helps in the real world

Pertmaster International, Inc.'s Pertmaster Advance Version 2.0 goes beyond simple scheduling and deals head-on with real project management issues, such as getting commitment from a project's sponsors and team members and improving resource allocations throughout a project.

Features. Pertmaster Advance 2.0 is a rewrite in the C language of the original Pertmaster. This version also includes a Lotus Development Corp.-like user interface, an interface for data base I/O, a built-in report writer and plotting capabilities.

Ironically, Pertmaster Advance does not use Program Evaluation and Review Techniques, or Pert, but requires multiple estimates and performs risk analysis. Nor does the program do complete resource-driven scheduling.

To plan a project in Pertmaster Advance, you can use a task list, a bar chart or a network diagram as the background for entering new tasks.

The new data base interface lets you import and export data from other project management software, and it can be programmed to upload and download data in ASCII form from mainframe programs.

Performance: Good. We tested Pertmaster Advance 2.0 on an IBM Personal Computer XT-based AT&T semicione under DOS 2.1 with a hard disk and a Hewlett-Packard Co. HP 7470A plotter.

On our minimum configuration system, Pertmaster Advance ran amazingly fast, with the type-ahead capability precluding any waiting time.

Continued on page 34

4Views fleshes out 1-2-3 capabilities

Turner Hall Publishing's 4Views is another contender in the Lotus Development Corp. 1-2-3 data base add-in fray. Although the package does not increase the data capacity of 1-2-3, it does offer extensions to 1-2-3's native data management capabilities. In particular, 4Views adds indexing, relational functions and computed fields to 1-2-3's data base.

Features: 4Views can import data directly from Ashton-Tate Corp.'s Dbase, or it can use existing 1-2-3 files. It does not store data to disk to increase capacity; rather, it works with data stored entirely in the 1-2-3 worksheet.

As its name implies, 4Views provides four views into the data base. The first is the traditional table view; the second displays records one at a time, with the fields arranged vertically; the third is the report view, which lists the data base page by page, exactly as it would print; and finally, 4Views offers a cross-tab view, which shows the relationships across data base fields. This feature is powerful but complex; it requires careful planning to get good results.

Turner Hall's 4Views

When using the table view, you can select data that you wish to display on-screen in any order. You can also create computed fields, which contain mathematical results based on the values of other fields in the data base. Selected records can be filtered out of the displays.

4Views can index in up to five fields. Unlike sorting, indexing changes the apparent order of the data but not the actual order. Changing the view or selecting records also does not change the underlying data file, although you can save selected or viewed data to a separate file for later use. You can also edit data in the table or form view, which changes the spreadsheet immediately.

4Views has a relational capability that allows you to view work sheet data from more than one data range at the same time. Data can be related by key or common fields. The view that you create from related ranges can be exported to a Dbase-compatible file or can be extracted to a new 1-2-3 range in the same work sheet.

Performance: Good. 4Views indexes faster than 1-2-3 can sort and allows sorting on five fields compared with 1-2-3's two. It also indexes about 50% faster than Ashton-Tate's Dbase III.

The ease with which you can change the arrangement and

Continued on page 34

Pertmaster

CONTINUED FROM PAGE 33

One complaint: In Pertmaster Advance 2.0, completed milestones stretch to the end of the project no matter when they start, and milestones and subprojects are always shown as 0% complete.

Documentation: Very good. The combined user's guide and reference manual is first-rate. Its strength lies in its authors' thorough knowledge of project management. The illustrated explanation of screens and windows is very valuable, and the reference section includes six detailed appendixes on file structures and error messages. Installation instructions, a quick-reference guide and a tutorial round out the documentation.

Ease of learning: Excellent. Learning aids include the menu-driven interface, on-line Help, documentation and the tutorial manual.

Ease of use: Very good. Version 2.0 incorporates Lotus-like menus with main selections on the top line and submenus or explanations below. It also makes use of both built-in and user-designed windows and screens. Other useful features include context- and window-sensitive on-line Help and well-defined function keys.

Error handling: Satisfactory. Pertmaster Advance 2.0 is a perfect example of a project that was released on time but not completely up to specification. The program failed more than once, resulting in unrecoverable errors. In each case, the error messages that appeared were not explained, or even listed, in the manual. Fortunately, the program's ungraceful failures are offset by thoughtful handling of human errors.

Support: Poor. Pertmaster International provides 90 days of non-toll-free technical support and program updates. After that, telephone technical support costs $20 per hour. A phone-support-plus-upgrades package is $200 per year if bought with the program.

We phoned technical support 12 times. Five of those times, no one was available. Seven times, we talked to an intelligent, friendly technician who encouraged us to keep calling. Unfortunately, you cannot solve problems with a good attitude alone.

Value: Good. PC-based project management programs fall into three categories: personal budget-priced programs; mid-priced packages, such as Software Publishing Corp.'s Harvard Total Project Manager; and Rolls-Royces, which support full graphics and plotting and can be used by all the members of a project planning team.

Pertmaster Advance is squarely in the middle. Its network scheduling and multiproject resourcing capabilities clearly justify its higher price, but despite its speed, plotter interface and report writer, we are not sure it is worth $900 more than the Harvard Total Project Manager.

On the other hand, Advance 2.0 can compete well with the sophisticated Computer Aided Management's Viewpoint.

4Views

CONTINUED FROM PAGE 33

views of your data is a plus, and the data filtering capabilities are also nice.

4Views' report-generating utilities are disappointing. Except for the cross-tab report, the supplied automatic report format is unsatisfactory. In order to get good reports, you have to program using the print functions. The major performance drawback, however, is the random-access memory limitation of 4Views' data files.

Documentation: Poor. The 4Views manual is about two-thirds reference and one-third tutorial. Although it is a good example of what desktop publishing can produce, the content does not live up to the form. Also, the index is incomplete — there is no listing of error messages and sections of the tutorial and reporting reference are just plain wrong.

Ease of learning: Good. The experienced 1-2-3 user, who also has a data base background, will be able to get up to speed quickly. 4Views uses standard Lotus 1-2-3-based moving-bar menus, and context-sensitive Help is just a keystroke away. Because 4Views combines data base and spreadsheet concepts, a good tutorial would be helpful.

Ease of use: Very good. 4Views' capability to save report, view, index, filter and relation criteria separately from the data makes daily operations a breeze. On-screen data entry and editing is also easy. Unfortunately, the 4Views standard report is not very useful and custom report generation is a difficult task.

Error handling: Good. 4Views provides comprehensive prompted menus and error messages for every conceivable operation. It is too bad that the documentation for the error messages is vague.

Support: Very good. Not copy protected, 4Views is covered by a 30-day money-back guarantee. Unlimited support calls are free, although they are not toll free. Technical support is available weekdays from 8 a.m. to 5 p.m. Pacific Standard Time.

If you call Turner Hall's technical support line without a Touch-Tone phone, its automatic routing system is likely to drop you. If you have a Touch-Tone phone, eventually you will reach a knowledgeable support person.

Value: Satisfactory. If you want to extend the data capacity of 1-2-3 to store data, look elsewhere. But if you can fit the data on your 1-2-3 work sheet and just need a better way to manipulate it, you should consider 4Views. Its relational facilities are quite impressive.

IBM without CCA.

If you want high performance from your IBM® mainframe, you can't get it from IBM alone. The only route to true high performance is Model 204 DBMS software from Computer Corporation of America.

From the 3090 to the 9370 and across all operating systems, Model 204 will make your application run faster now. CCA software combines power and flexibility to handle large databases and complex applications. And it helps you handle the biggest business challenge of all-the future.

We've been dedicated to one thing for over 20 years: building high-performance software. We never stop working to make our products run faster and better. Today, they outperform everything else.

Remember, no matter what your mainframe looks like: without CCA, high performance is just an empty promise.

IBM is a registered trademark of IBM Corporation

NEW PRODUCTS

Systems

An IBM Personal Computer XT-compatible data acquisition computer has been developed by **Lamar Instruments**.

Data-Ack is powered by a 12V battery and uses 3½-in. disk drives. A 110V AC converter is not required.

Weighing 12 pounds, the system has seven full-length card slots and runs all Microsoft Corp. MS-DOS-compatible programs, including word processing applications. A 10-MHz processor with Intel Corp. 80286 and 80386 microprocessors is standard and has up to 20 MHz optional.

Lamar's *Data-Ack*

The computer is compatible with all IBM battery-powered portable printers.

Data-Ack costs $995, which includes 640K bytes of random-access memory and a 3½-in. floppy drive.

Lamar Instruments, 2107 Artesia Blvd., Redondo Beach, Calif. 90278. 213-374-1673.

A media-independent system that incorporates optical disk storage, microfilm and magnetic storage has been introduced by **Imnet Corp.**

The **Imageview** system relies on IBM Personal Computer AT-compatible hardware and can be expanded, if necessary, through industry-standard networking products such as Ethernet. An entry-level system with a 5¼-in. optical disk includes a high-resolution display workstation, an image input and indexing workstation, a document scanner or microfilm camera, a data base management server and an output station with a laser printer.

Imageview is priced from $39,000.

Imnet, 34 Maple Ave., Pine Brook, N.J. 07058. 201-882-2777.

Advanced Graphic Applications, Inc. has announced a personal computer-based work flow management system, the **Discus 2001**.

The system is said to allow users to store, access and share data, images and sound in a Microsoft Corp. MS-DOS environment. The product integrates into existing microcomputer-, minicomputer- or mainframe-based organizations with support offered for token-ring and Ethernet.

Each workstation is based on an IBM Personal Computer AT or a Personal System/2 platform with varying combinations of a scanner, a high-resolution monitor, a laser printer, a mouse and a telephone. The product includes an MS-DOS driver for optical disk subsystems and proprietary applications. Development software is also available.

The Discus 2001 is individually priced, based on user configuration requirements.

Advanced Graphic Applications, 90 5th Ave., New York, N.Y. 10011. 212-337-4200.

Software applications packages

Intex Solutions, Inc. has released a companion product for Lotus Development Corp.'s 1-2-3 and Symphony.

Trans 1-2-3 converts ASCII files into .WKS format for 1-2-3 or Symphony spreadsheets. The package formats columns by interpreting patterns of the source file and can distinguish numeric entries from labels. It also creates four spreadsheet formats: .WKS, .WK1, .WRK and .WR1.

The product runs on the IBM Personal Computer, PC XT, AT, Personal System/2 and compatibles and operates under IBM PC-DOS or Microsoft Corp. MS-DOS Versions 2.0 or higher. The size of the ASCII file determines memory requirements: 200K bytes for a 100-line source file; 500K bytes for the maximum 1,000-line file. It runs on all versions of 1-2-3 and Symphony.

Trans 1-2-3 costs $95 plus shipping.

Intex Solutions, 568 Washington St., Wellesley, Mass. 02181. 617-431-1063.

Personal computer-based software that combines data acquisition and instrument control into one interface has been announced by **Capital Equipment Corp.**

The **Acquisition Engine** can be used to gather and record information, control processes and regulate instruments. The engine reportedly works with any analysis software, including Lotus Development Corp.'s 1-2-3. The package offers multiprocessing, time-based data acquisi-

Continued on page 36

COMPUTER CORPORATION OF AMERICA
Four Cambridge Center, Cambridge, MA 02142
CCA Information Center: 1-800-848-4400 ext. 299

DISOSS
DOCUMENT STORAGE REPORTER
Find out what's in your DISOSS library and PS/CICS document pool.
• Reports on all documents
• Runs while DISOSS is active
• SMF accounting records
• Free 30-day trial
TBS Software Inc.
28 Viamede Cr.
North York, Ontario
Canada M2K 2A8
(416) 221-5140

Continued from page 35
tion, trigger events and high-speed direct memory.

Interfaces supported include IEEE-488 and RS-232. The system runs on the IBM Personal Computer, PC XT, AT and compatibles.

The Acquisition Engine costs $349.

Capital Equipment, Suite 107, 99 S. Bedford St., Burlington, Mass. 01803. 617-273-1818.

A menu-driven bookkeeping system for the IBM Personal Computer, PC XT, AT and compatibles has been introduced by **Hooper International.**

Finance Manager II consists of five integrated modules: General Ledger, Account Reconciliation, Financial Utilities, Accounts Payable and Accounts Receivable. Except for Account Reconciliation, which requires General Ledger, all modules can run independently.

The system requires Microsoft Corp.'s MS- or IBM's PC-DOS 2.0 or higher, 256K bytes of random-access memory and two floppy disk drives or one floppy and one hard drive.

Modules are priced separately from $15 to $40, with a 15% discount for the entire system.

Hooper International, P.O. Box 62219, Colorado Springs, Colo. 80962. 719-528-8989.

Saba Technologies, Inc. has announced **Page Reader 2.0**, an optical-character recognition device that scans single- or multipage documents into personal computer applications for revision and updating.

With the new product, the vendor has reportedly increased data entry speed by 25% over the previous version and has added the Tag Image File Format to its graphics formatting capability.

Page Reader 2.0 supports draft dot matrix fonts produced from most Epson America, Inc., Okidata Corp. and Toshiba Corp. printers. The product runs on IBM Personal Computers, PC XTs, ATs and compatible systems with IBM's PC-DOS 2.1 or higher.

Page Reader 2.0 costs $1,299.

Saba Technologies, 9300 S.W. Gemini Drive, Beaverton, Ore. 97005. 503-626-7050.

Zylab Corp. has upgraded its text search and retrieval program with the announcement of **Zyindex 3.0.**

Version 3.0 reportedly searches 10M bytes of information in five seconds on an IBM Personal Computer AT for a single-word request. The product also searches the native format of most word processors and ASCII files, eliminating the need for end-user conversion of documents to ASCII. Binary file indexing prevents a search of unwanted information.

The program is offered in three configurations and costs from $95 to $695.

Zylab, 3105-T N. Frontage Road, Arlington Heights, Ill. 60004. 312-632-1100.

A project management tool for IBM Personal Computers and compatibles has been announced by **Micro Planning International.**

Called **Micro Planner for Windows**, the graphics-based package allows users to draw logic diagrams, calculate and display deadline and resource information and view potential project bottlenecks.

The mouse- and menu-driven user interface permits users to work without having to learn new routines, and the product provides multitasking capabilities.

Micro Planner for Windows costs $595.

Micro Planning, Suite 840, 235 Montgomery St., San Francisco, Calif. 94104. 415-788-3324.

Software utilities

A software utility for the IBM Personal Computer, PC XT, AT and compatible computers has been released by **R. J. Swantek and Associates.**

Soft-Xplore, a disassembler and patcher, uses four algorithms to separate code from data at a rate of 10,000 line/min on a hard disk.

The product will disassemble anything in files or random-access memory and can process the Intel Corp. 80386 and 80387 instruction set. Patches are kept in a separate file for documentation purposes. Soft-Xplore requires two floppy drives or a hard disk and a floppy drive with a minimum of 256K bytes of memory for Microsoft Corp. MS- or IBM PC-DOS 2.0 and higher.

Soft-Xplore is priced at $79.95.

R. J. Swantek, P.O. Box 1032, Hartford, Conn. 06111. 203-560-0236.

Sterling Castle Software has introduced **Forget-Me-Not**, a random-access memory-resident utility package for executing unattended batch files or applications. The program runs on IBM Personal Computers and compatibles and works in either a single workstation or a local-area network environment.

Forget-Me-Not can send a reminder message to the sender or to another network node as electronic mail. The user can designate messages to be delivered immediately or at a specific time or can program the system to replay a message on a daily, weekly or monthly basis.

Forget-Me-Not costs $79.95.

Sterling Castle, Suite 174, 702 Washington St., Marina Del Ray, Calif. 90292. 800-722-7853.

A text retrieval utility that allows files, paragraphs and other blocks of text to be treated as records is available from

Continued on page 38

All it takes is our STD 1600.

The STD 1600 data communication terminal provides efficient, reliable, timely data transfer to eliminate the overnight wait for delivery. It communicates with any bisynchronous terminal or computer.

The STD 1600 can communicate on-line or off-line at speeds up to 56KB to get time-sensitive data from one location to another.

The STD 1600 supports dial-up or leased lines and is easy to use. No software required, and installation can be accomplished in less than an hour.

Since 1969, Mitron's magnetic tape systems have been used in a wide variety of data communications applications. Let us explain how you can connect the STD 1600 to your system or data communication network. Can be leased or purchased.

Call 800 638-9665 (in Maryland, 301 992-7700).

MITRON
Systems Corporation
2000 Century Plaza, Columbia, MD 21044

Finally, a software company that realizes it takes more than a computer to run business applications.

Every software company strives to create business applications that run better, faster and more efficiently on your computer.

But while your system gets all the attention from most vendors, the people who use it are commonly forgotten. Left to struggle with business applications that don't always conform with the way they do their jobs.

Backlogs, missed reporting deadlines, and lost productivity are often the result.

At McCormack & Dodge, we never lose sight of the fact that people use our applications every day. And people need business software that easily adapts to their working needs.

To that end, we bring you customer-controlled software. The latest in the evolution of our borderless Millennium® technology.

With customer-controlled software, you decide how the system operates, based on your individual business requirements

Take our General Ledger package. A manufacturer might turn it into a product line reporting system, while a government user sets it up for budgetary control.

Then there's our currency management software. It allows you to meet complex reporting requirements in virtually any currency. No matter where in the world your company operates.

And because M&D operates in over 40 countries, you can be sure that our top-rated service and support are never far away.

If you think your business can realize the potential of customer-controlled software, or any of our Financial, Human Resource, Manufacturing and Application Development systems, call McCormack & Dodge at 1-800-343-0325.

We put the customer in control of the software.

McCormack & Dodge

a company of The Dun & Bradstreet Corporation

We put the customer in control of the software.

Continued from page 36

O'Neill Software.

Text Collector works with ordinary word processing files to collect and organise scattered blocks of text, prepare reports and track information.

The program includes several application packs that demonstrate how to use the program in specific areas, such analyzing questionnaires or searching legal documents.

The product operates on IBM's Personal Computer, PC XT, AT, Personal System/2 or compatible computers, the vendor said.

Text Collector costs $69.

O'Neill Software, Suite 1822, 440 Davis Court, San Francisco, Calif. 94111. 415-398-2255.

Micrographix, Inc., has announced the **Postscript Driver**, intended to enhance Adobe Systems, Inc. Postscript printer support of Micrographix's Designer, Aldus Corp.'a Pagemaker, Microsoft Corp.'s Excel and other Microsoft Windows-compatible applications.

Improvements include support for Adobe color extensions, encapsulated postscript and rotated text. The driver is one third as large as the previous model.

Postscript Driver costs $199.

Micrographix, 1820 N. Greenville Ave., Richardson, Texas 75081. 800-272-3729.

Development tools

Clarion Software has released **Version 2.0** of the **Clarion Professional Developer**, a package that creates personal computer application programs.

The product allows the user to create applications with point-and-shoot menus, scrollable tables and pop-up forms without writing any code. The source code generated can be modified with the integrated editor. Prewritten code in Clarion, assembler and C can be used in the application. A DOS shell is also included.

The Clarion Professional Developer costs $695.

Clarion, 150 E. Sample Road, Pompano Beach, Fla. 33064. 305-785-4555.

Boston Software Systems, Inc. has released **Version 3.4** of its **Boston Access** interface development package. The software has been updated to allow nontechnical users to create interfaces for moving data between micro, mini and mainframe computers.

The package reads data directly from the screen buffers of one application and then inserts the data into the keyboard buffers of another application. Boston Access will interface applications running on an IBM Personal Computer or applications that can be accessed on the PC using terminal emulation. The product requires an IBM PC, Personal System/2 or compatible and 128K bytes of random-access memory.

Boston Access 3.4 costs $550.

Boston Software, 76 Whitney St., Sherborn, Mass. 01770. 617-653-5105.

A microcomputer-based development tool for analysts who need to define screens for IBM's CICS or IMS/DC applications has been announced by **Integrated Systems Technology, Inc.** No knowledge of CICS or IMS/DC programming is required, the vendor said.

The product combines prototyping applications and map-definition functions to allow screen presentation without access to CICS, IMS/DC or an IBM 370 mainframe. **Quick Screen 3270** runs on IBM Personal Computers or Personal System/2s and requires less than 400K bytes of memory.

Quick Screen 3270 costs $295 per license.

Integrated Systems, 5 Chapel Hill Road, Short Hills, N.J. 07078. 201-376-3722.

Software enhancements

An enhanced version of the **Summasketch Professional** tablet is now available from **Summagraphics Corp.**

Now offering up to 1,016 line/in. resolution, the product comes with a mouse emulator, a Microsoft Corp. Windows driver, interface cables, a four-button cursor, a two-button stylus and a two-year limited warranty.

The tablet was designed for high-end workstations using computer-aided design with high-performance software such as Autodesk, Inc.'a Autocad, Micro Control Systems' Cadkey and Versacad Corp.'a Versacad. Summasketch Professional is priced at $999.

Summagraphics, 777 State St. Extension, Fairfield, Conn. 06430. 203-384-1344.

Data storage

A 1.2M-byte floppy disk drive for the IBM Personal System/2 is available from **Pacific Rim Systems, Inc.**

The external 5¼-in. floppy drive allows users of high density IBM Personal Computer AT-compatible diskettes direct access to the PS/2 system, the vendor said.

The **PRS-2** 1.2M-byte drive reads and writes all standard disk formats and can be used with the PS/2 Models 25, 30, 50, 60 and 80.

The unit measures 1¾ in. high by 6 in. wide by 10 in. deep and weighs 3.5 pounds.

No external power supply is necessary for operation.

The PRS2 costs $350.

Pacific Rim Systems, 2570 Barrington Court, Hayward, Calif. 94545. 415-782-1013.

LEAVE DEVELOPMENT TROUBLES BEHIND

With Realia's development tools, you can build efficient mainframe applications right on your PC. Every stage of development gets easier, whether you're maintaining an existing application or creating a new one.

- Realia COBOL, the fastest PC COBOL compiler, produces the most efficient executable programs.
- REALCICS® lets you develop and run mainframe CICS programs on the PC.
- RealDBUG offers interactive, source-level debugging better than any mainframe tool.

Choose Realia, and your applications backlog can soon be just a memory.

REALIA®

10 South Riverside Plaza, Chicago, IL 60606 • (312) 346-0642 • Telex 332979

Siemens Memory Products Division has introduced two 380M-byte Winchester disk drives.

The **Megafile 4410 Extended Small Disk Interface** drive and the **Megafile 4420 Small Computer Systems Interface** drive reportedly maintain data transfer rates of 15M bit/sec.

The 4420 operates in synchronous

A Siemens *Winchester drive*

mode with burst rates up to 4M byte/sec., and both drives have an average access time of 18 msec. The drives are available to OEMs for immediate delivery.

The 4410 and 4420 cost $1,895 each in OEM quantities of 100 per year.

Siemens, Suite 325, 5655 Lindero Canyon Road, Westlake Village, Calif. 818-706-8872.

Emerald Systems has introduced enhanced small device interface (ESDI) hard-disk subsystems for Novell, Inc.'s Netware 2.1. The series contains seven models and is said to have a data transfer rate of 10M bit/sec.

Available in internal and external configurations, the basic ESDI hard drives have capacities of 150M and 300M bytes. The 600M-byte versions of the drive, the **LAN 600-3122** and the **LAN 600-5122**, each combine two 300M-byte drives to form one logical unit. The **3120** series is designed for internal installation in the IBM Personal Computer AT, the Compaq Computer Corp. Deskpro and other Intel Corp. 80286- and 80386-compatible systems running Netware 286 2.1.

Pricing on the seven-drive series ranges from $3,995 for the 150M-byte **LAN 150-3122** to $15,995 for the LAN 600-5122.

Emerald, 4757 Morena Blvd., San Diego, Calif. 92117. 619-270-1994.

Printers/Plotters/Peripherals

Tegra, Inc. has announced a **Postscript-Compatible Interpreter (PCI)** option for its line of image setters.

PCI is an option for the Tegra image controller, the basic Tegra system unit that drives both film recorders and plain-paper output devices. The product consists of proprietary hardware and software modules that interpret the Adobe Systems, Inc. Postscript page description language.

The PCI option offers an RS-232 interface for use with workstations, IBM Personal Computers and clones and an Apple Computer, Inc. Appletalk network interface for use with Macintoshes.

The PCI option costs $19,500.

Tegra, 900 Middlesex Tnpk., Billerica, Mass. 01821. 800-228-3471.

AST Research, Inc. has unveiled the **Turboscan/Flatbed Scanner**, which reportedly allows documents of any shape to be scanned in 10 to 40 sec.

Designed for desktop publishing and office automation applications, the scanner converts color or black-and-white text, handwriting, artwork and photographs into binary code for processing.

Images up to 8½ by 14 in. are digitized into the computer at 300 by 300 dot/in. resolution. A line-art mode is available for black-and-white materials, and a half-tone mode for documents with continuous shading is an option.

The Turboscan/Flatbed Scanner costs $1,995 for IBM-compatible systems and $1,899 for use with Apple Computer, Inc. Macintoshes.

AST, 2121 Alton Ave., Irvine, Calif. 92714. 714-863-1333.

A biometric security product that identifies users by fingerprint has been introduced by **Indentix, Inc.** The **Touchsafe** finger scanning system stores a mathematic characterization of the fingerprint in memory and can be linked to a computer system or a terminal.

The system is slightly larger than a computer mouse and connects by cable to the desired system. Two hardware versions are available: the internal module is a printed-circuit board that plugs into an IBM Personal Computer bus or a compatible, and the external module is contained within a metal enclosure that connects via an RS-232 interface to the computer.

The cost of Touchsafe with an internal module is $1,795. A system with the external module costs $1,895.

Indentix, 2452 Watson Court, Palo Alto, Calif. 94303. 415-858-1001.

Several **device drivers** for Freelance Plus and Graphwriter II are now available from **Lotus Development Corp.**

The drivers support a variety of output devices, including the Canon U.S.A., Inc. LBP-8II laser printer, the Epson America, Inc. JX-80 color dot matrix printer, the Hewlett-Packard Co. Deskjet ink-jet printer and the IBM Video Graphics Array card. Support is also available for various Toshiba Corp., NEC Corp. and Xerox Corp. printer products. The device drivers are available in 5¼- and 3½-in. media.

The disk costs $20 for registered Freelance Plus and Graphwriter II users.

Lotus, 55 Cambridge Pkwy., Cambridge, Mass. 02142. 617-577-8500.

Texas Instruments, Inc. has announced an additional postscript printer for its Omnilaser 2000 series. The **Omnilaser 2106**, designed for workstation use, offers 35 resident typefaces and expanded paper-handling functions.

Interfaces are available for the Apple Computer, Inc. Macintosh, the IBM Personal Computer and compatibles. The 2106 will emulate several output devices, including the Xerox Corp. Diablo 630, the Hewlett-Packard Co. Laserjet Plus and the HP 7475A plotter. The product prints six page/min.

The Omnilaser 2106 costs $4,595.

TI, P.O. Box 655012, Dallas, Texas 75265. 800-527-3500.

Board-level devices

PC Technologies, Inc. has introduced two versions of an accelerator that give users the option of a 12- or 16-MHz Intel Corp. 80286 microprocessor speed on the IBM Personal System/2 Model 30 and other compatible Intel 8086-based microcomputers.

Called the **286 Express/30-12** and the **286 Express/30-16**, both versions of the full-slot board include a software-programmable system configuration and keyboard-selectable 80286 and 8086 processing with 16K bytes of cache memory. Support for an optional Intel 8087 coprocessor in the system and an optional 80287 on the board are also provided.

The 286 Expressway/30-12 costs $575. The 286 Expressway/30-16 costs $695.

PC Technologies, P.O. Box 2090, Ann Arbor, Mich. 48106. 800-821-3086.

A 32-bit memory expansion board for the Compaq Computer Corp. Deskpro 386 has been introduced by **Computer Peripherals, Inc.**, an OEM of enhancement products for IBM and compatible computers.

The **386 Memoire** supports up to 2M bytes of parity-checked memory and was designed to fit the 32-bit memory expansion slot on the Compaq machines.

The 386 Memoire costs $695 for a 1M-byte version and $1,145 for a 2M-byte version.

Computer Peripherals, 667 Rancho Conejo Blvd., Newbury Park, Calif. 91320. 805-499-5751.

Procom Technology, Inc. has introduced a 1.2M-byte external 5¼-in. floppy disk drive for use with all models of IBM Personal System/2 computers.

The **PXF1200**, with a data transfer rate of up to 500K bit/sec. and a 3-msec access time, lets users transport and share information between PS/2s and the older generation of IBM Personal Computers, PC XTs, ATs and compatibles. The disk has its own internal controller and can read, write and format 360K- and 1.2M-byte diskettes. It has a mean-time-between-failure rate of 12,000 hours.

The PXF1200 costs $450.

Procom Technology, Suite 128, 3100 Airway Drive, Costa Mesa, Calif. 92626. 714-549-9449.

IGC has announced **VM/386 1.10**, a multitasking control program for IBM, Compaq Computer Corp. and other microcomputers that is now available for the IBM Personal System/2 Model 80.

New features include improved hard-disk I/O support and support for IBM's Video Graphics Array and a shared random-access memory disk.

VM/386 uses the virtual Intel Corp. 8086 mode of the Intel 80386 to create a series of guest virtual machines and provides a separate copy of DOS for each. The product supports the Compaq Deskpro series, the Kaypro Corp. 386, the Acer Technologies Corp. 1100 and other compatibles. Both 3½- and 5¼-in. media are included.

The VM/386 1.10 costs $245 and is distributed through Lifeboat Associates.

IGC, 4800 Great America Pkwy., Santa Clara, Calif. 95054. 408-986-8373.

The **Mitac Paragon 286V** personal computer is now available for U.S. delivery from Taiwan-based Mitac International Corp.'s American division, **American Mitac Corp.**

The small-footprint, Intel Corp. 80286-based IBM Video Graphics Array (VGA)-compatible PC was designed for office, engineering and scientific applications. The system has a VGA-compatible video adapter built into the main board and can also emulate IBM Enhanced

Mitac's *Paragon 286V*

Graphics Adapter, Color Graphics Adapter and Hercules Computer Technology, Inc. standards.

The Paragon 286V also includes 3½-in. floppy disk drives, an Intel 80286-12 CPU, a floppy-disk controller, Phoenix Technologies, Inc. Bios and 1M byte of random-access memory.

The Paragon 286V is priced from $2,195.

American Mitac, 410 E. Plumeria Drive, San Jose, Calif. 95134. 408-432-1160.

Uptime

Provide 24 Hour CICS Service

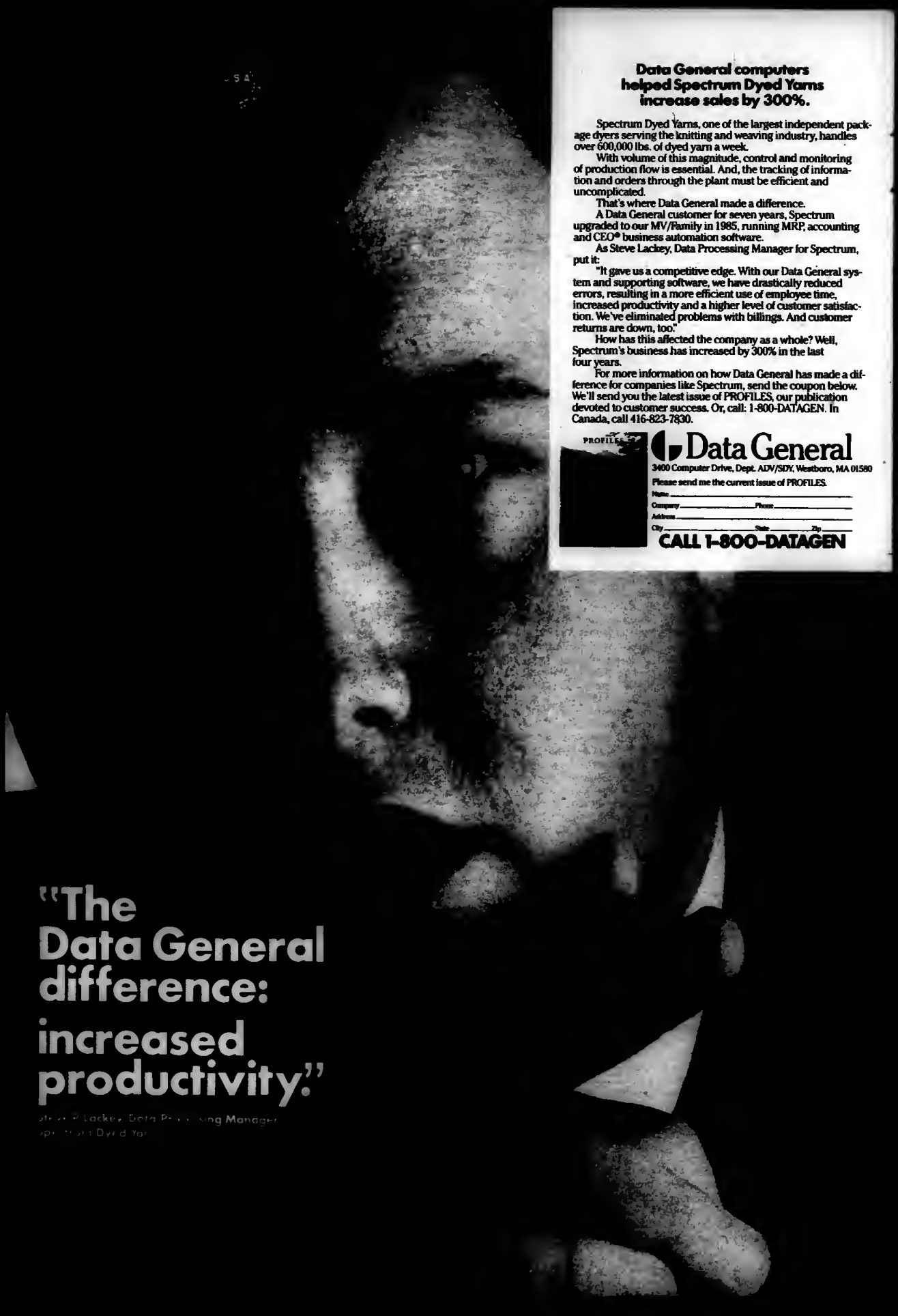
IBM gave dynamic allocation to CICS... but you need Netec's CAFC to make non-stop CICS a reality. CAFC allows a single command to OPEN or CLOSE 5 or 50 files. CAFC establishes two way communication between your CICS regions and your batch jobs. Your batch jobs will always have the files they need for processing without operator intervention.

Browse and Archive CICS 1.7 Dumps

The CICS Dump Display Facility gives your support staff instant on-line and hardcopy access to CICS transaction and system dumps. You may view and print any dump without disturbing CICS. CDDF archives your dumps for after-the-fact analysis. You may route dumps to remote locations.

NETEC

Netec International, Inc.
P.O. Box 180549 · Dallas, Texas 75218
Telex 314419 TELECOM UD (214) 343-8744



Data General computers helped Spectrum Dyed Yarns increase sales by 300%.

Spectrum Dyed Yarns, one of the largest independent package dyers serving the knitting and weaving industry, handles over 600,000 lbs. of dyed yarn a week.

With volume of this magnitude, control and monitoring of production flow is essential. And, the tracking of information and orders through the plant must be efficient and uncomplicated.

That's where Data General made a difference.

A Data General customer for seven years, Spectrum upgraded to our MV/Family in 1985, running MRP, accounting and CEO® business automation software.

As Steve Lackey, Data Processing Manager for Spectrum, put it:

"It gave us a competitive edge. With our Data General system and supporting software, we have drastically reduced errors, resulting in a more efficient use of employee time, increased productivity and a higher level of customer satisfaction. We've eliminated problems with billings. And customer returns are down, too."

How has this affected the company as a whole? Well, Spectrum's business has increased by 300% in the last four years.

For more information on how Data General has made a difference for companies like Spectrum, send the coupon below. We'll send you the latest issue of PROFILES, our publication devoted to customer success. Or, call: 1-800-DATAGEN. In Canada, call 416-823-7830.

PROFILES

Data General

3400 Computer Drive, Dept. ADV/SDY, Westboro, MA 01580

Please send me the current issue of PROFILES.

Name _____

Company _____ Phone _____

Address _____

City _____ State _____ Zip _____

CALL 1-800-DATAGEN

DBMS targeted at tyros

BY SALLY CUSACK
CW STAFF

DALLAS — Novice and casual microcomputer data base users can take heart. At least that is the promise of a relational data base management system, aimed at nonpower users, recently introduced by Caltex Software, Inc.

The program, called D, was written in its own language and uses s bare-bones command set structure that makes it less intimidating than other data base packages, such as Ashton-Tate Corp.'s Dbase III, the vendor claimed.

While the more seasoned and technically oriented user may object to learning s new language, the product could prove s boon for those who lack hardcore personal computer expertise and have carefully avoided data base systems in the past. For these folks, an easy-to-learn language may be just the ticket.

"We wanted a package that allows a user to access data, as opposed to s product designed for a programmer to manipulate data," said Jules Brenner, president of Caltex. "We are trying to establish our 'thinnest layer' philosophy, that is, to put the thinnest possible layer between the user and the data."

The product currently has an installed base of 200 and is primarily targeted for shipment to the value-added reseller market. The package runs on IBM Personal Computers, PC XTs, ATs or compatibles with DOS 2.0 or higher.

D carries a price of $395.

Barney

FROM PAGE 31

They still want it all. Microsoft almost has it all. They've got multiple operating systems, most languages except English, mice, accelerator and memory boards and applications in almost every important or even semi-important category.

And when a competitor pioneers a market, it is not long before Microsoft jumps in somehow, some way. It seems the firm wants much more than to plunder Lotus's sacred spreadsheet market. In fact, it looks like the next target may be strategic partner Ashton-Tate, which has an agreement to resell Microsoft's SQL Server.

According to industry know-it-alls, Microsoft coders are cranking out a single-user data base software package that by its very definition will compete with Ashton-Tste'a Dbase. The product, which is still tightly under wraps, could serve as a front end for the server product or as a stand-alone system.

Well maybe fair's fair. After all, Ashton-Tate did announce plans to use an SQL engine from Interbase that by its very definition will compete with SQL Server.

Foul language? We recently received a copy of a letter sent to Microsoft Chairman Bill Gates from an irate user of Microsoft's Cobol.

It seems that Heywood G. Klebenov, president of Resolution Data, was planning to use the Cobol to develop a system that could run under either Microsoft's MS-DOS or Xenix and eventually OS/2. Promises of a single language that works in all three environments led Klebenov to go for Microsoft's Cobol in the first place.

But Klebenov says Microsoft may be moving away from single Cobol support for all three environments. Instead, the company is planning to market Micro Focus's Cobol for OS/2 and possibly freeze development of its own Cobol. Try as be might, Klebenov has not yet determined what the firm's Cobol strategy is.

SQL Server goes naked? Speaking of SQL Server, it appears that this anxiously awaited product, which runs on servers and provides data to multiple users, will lack one thing when released later this year: s broad array of front-end tools.

Right now, Microsoft is overly dependent on partner Ashton-Tate to move the still-unshipped Dbase IV over to the server and on Ansa Software to ante up with a version of Paradox. According to our source, the Microsoft folks are a bit worried about the timing of Dbase IV, s product that is desperately needed if SQL Server is to take off.

Lotus TACs out. Lotus was prepping The Application Connection (TAC) 5.0 for s mid-May release, but new software honcho Frank King doesn't much like preannouncements, so look for a June debut instead. The micro-to-mainframe file transfer and translation software package has been rewritten in C, and the company boasts of its greater performance and ability to make end users more self-sufficient through s menu-based feature called The Selection.

The system is also said to include Blueprint, an unshipped Lotus interface that allows Lotus applications to connect to a variety of supported DBMSs.

But don't expect to get TAC 5.0 all at once. It will ship in two sets, one in the third quarter — with support for IBM's SQL/DS — and the complete system by year's end, a Lotus source said.

Mathsoft to add high-end? According to s source briefed by the firm, Mathsoft is set to move from low-end PC-based equation solving to high-end mathematic software, priced from $5,000 to $8,000, for Sun workstations. How much is that per equation?

Barney is a Computerworld senior editor, microcomputing.

NCR offers Intel board trade-in

BY JAMES A. MARTIN
CW STAFF

DAYTON, Ohio — NCR Corp. recently announced a program in which users of the NCR PC810 microcomputer receive an allowance when trading in that micro's Intel Corp. 80286-based processor board for an Intel 80386-based board.

In exchange for the trade-in, the user can choose between a cash rebate or a Microsoft Corp. Windows 386 software package and an NCR mouse, the company said.

NCR's PC810 is based on the company's passive back-plane architecture, with the CPU on an add-in board instead of the motherboard, as with most microcomputers. This "split-card" architecture enables users to replace CPUs through the use of add-in cards.

Faster than AT?

"When upgraded, the PC810 will have the same functionality as the 80386-based NCR PC916, which processes information 2½ to three times faster than 80286-based AT compatibles," said Vernon Yates, vice-president and general manager of NCR's Personal Computer Division.

For s 1-year-old board, the trade-in allowance is $225; 2- and 3-year-old boards earn rebates of $150 and $75, respectively. To upgrade the PC810, NCR is offering s $2,295 upgrade kit that includes a 386 upgrade card, a companion memory board and a bus extended to connect the two components.

The program lets users who previously did not have a need for 386 micros upgrade without losing their initial hardware investment, Yates said.

Have you done a BSP or strategic plan and then wondered what to do next ?

If so, please attend a free seminar that will present practical solutions to this problem.

American Management Systems, Inc. presents

INFORMATION SYSTEMS ARCHITECTURE: FULFILLING THE PROMISE

Principal speaker Mr. W.H. Inmon

Phoenix
May 23, 8- 11 a.m.
Crescent Hotel
2620 W. Dunlap Ave.
Phoenix, AZ.

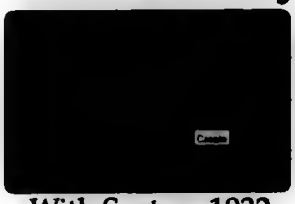
Anaheim
May 27, 8:30-11:30 a.m.
Sierra Tower-Balboa Room
1150 W. Cerritos Ave.
Anaheim, CA.

No. California
May 25, 8-11 a.m.
Santa Clara Marriot
2700 Mission College Blvd.
Santa Clara, CA.

To register please call Bill Pomeroy or Diane Hughston
Denver - (303) 689-7066 or
San Francisco - (415) 622-3066

May 26, 8-11 a.m.
Hyatt Regency
5 Embarcadero Ctr.
San Francisco, CA.

Unlock Programmer Productivity

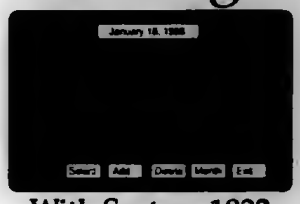


With System 1032 Application Facility

System 1032/AF automatically generates most of your application code from menu selections. Yet you can add custom procedures wherever you need something special.

CompuServe
Data Technologies
Tel: (617) 661-9440
DEXPO Booth #1122

Unlock M.I.S. Backlogs



With System 1032 Application Facility

One keystroke builds a standard application from any System 1032 database you indicate. You then extend this prototype into a full-fledged system by filling in specification menus.

CompuServe
Data Technologies
Tel: (617) 661-9440
DEXPO Booth #1122

Fed PC buys tripled in '87; total near 500,000

BY ALAN J. RYAN
CW STAFF

WASHINGTON, D.C. — Federal agencies stepped up their microcomputer purchasing rate last year, buying nearly 200,000 personal computers. That brings the total number of PCs in operation in the federal government to nearly half a million.

Those statistics, gathered in a study by the U.S. General Services Administration (GSA), show that the pace of computer acquisition by federal agencies is increasing as the agencies turn to automation, according to Frank J. Carr, commissioner of GSA's Information Resources Management Service.

Carr said the study revealed that agencies bought almost three times as many microcomputers in fiscal 1987 as in fiscal 1985, during which 67,502 PCs were purchased. No survey was conducted on 1986 purchases.

The buying trend bodes well for Zenith Data Systems, which supplied more than half the PCs acquired by the government in fiscal 1987. Zenith provided 116,984 units, or 59% of total federal purchases. The Zenith purchases cost the government $249 million.

Placing a distant second in microcomputer sales to the government was IBM, with 9.6% of the total in fiscal 1987. Wyse Technology, NCR Corp. and Compaq Computer Corp. also broke into the list of the 10 largest government PC suppliers. Wyse, NCR, Compaq, Wang Laboratories, Inc., AT&T, Apple Computer, Inc., Unisys Corp. and Epson America, Inc. shared 16% of the federal market. The remainder was supplied by 647 vendors.

Your tax dollars at work

Last year, the government spent a total of $614.1 million on microcomputers, the survey showed. As of October 1987, there were 490,400 microcomputers in use in federal offices; the total cost of the units was reported to be $1.8 billion.

The largest PC user within the government is the Department of Defense, which owns 68% of the micros in use. The departments of the Air Force and the Army each have 22% of the DOD total, followed by the Navy with 19%.

The largest civilian agency user is the Department of the Treasury, with 7%, followed by the National Aeronautics and Space Administration with 4% and the departments of Agriculture and Transportation with 3% and 2%, respectively, according to the study.

"If this rate of acquisition continues, more than a million microcomputers will be in use in the government by the early 1990s," Carr said.

Over 250 TV and radio stations depend on WSI for prompt, accurate weather data.

WSI SUPERstat™

WSI depends on the ACS 4030.

"With the ACS 4030 we have a low-cost, reliable Ethernet bridge that guarantees we can maintain the on-time service our customers expect."

Paul Bayer, Ph.D.
Director of Computer Services, WSI

WSI is the world's leading private supplier of on-demand weather information and graphics. WSI relies on the ACS 4030 as the critical link that allows satellite data to flow continuously from a remote Ethernet to applications processors at WSI headquarters.

WSI saved money by choosing the ACS 4030. Bayer checked into other remote bridges but chose the ACS 4030. "It had all the features we needed and was priced considerably less than the others."

With the ACS 4030, remote LANs function as a single network. Explains Bayer, "Now that we transparently connect all of our Ethernets, operations are a lot easier for WSI's programmers and system managers." The ACS 4030 fits into WSI's existing system with no need for additional expensive equipment.

The ACS 4030 is simple to install. It learns and filters addresses automatically and maintains high throughput between LANs. And you can connect ACS 4030s with multiple ports to level the traffic load and provide redundant links.

If you want the benefits of linking your remote Ethernets, choose a bridge with proven reliability. ACC has been meeting the network needs of companies like WSI for over 12 years. To find out how the ACS 4030 can make your computing resources more efficient and save you money, *call ACC today.*

Advanced Computer Communications
720 Santa Barbara Street
Santa Barbara, CA 93101
(805) 963-9431

ACC®
The Interconnectivity Source

Mac to receive Autocad version

BY JULIE PITTA
CW STAFF

SAUSALITO, Calif. — Autodesk, Inc. is porting Autocad, its widely used computer-aided design (CAD) and drafting software package, to Apple Computer, Inc.'s Macintosh II.

The decision to introduce a Mac version of Autocad marks the first time Autodesk has used an Apple system as a platform for its software. The version is set to ship sometime during the third quarter.

Autodesk sells versions of Autocad for Microsoft Corp. MS-DOS-based personal computers, Sun Microsystems, Inc.'s Motorola, Inc.-based Sun-3 workstations running the Unix operating system and Apollo Computer, Inc.'s Motorola-powered DN 3000 and 4000 workstations running the proprietary Aegis operating system in addition to Digital Equipment Corp.'s Microvax workstations running VMS.

Malcolm Davies, Autodesk's vice-president of marketing and sales, said before last year's introduction of the Motorola 68020-based Macintosh II that Apple did not have a suitable platform for Autocad. "Apple didn't have a serious workstation until the Mac II," he said. "None of its previous systems had the power and performance needed for CAD."

Davies said Autocad for the Mac II employs the same code as earlier versions of the software. "It's not a rewrite or a subset," he noted. "But it runs under Mac Windows and has some Macintosh features."

Dave Burdick, an analyst at Dataquest, Inc., said the introduction of CAD software packages for the Macintosh will add steam to Apple's efforts to penetrate the engineering market. Apple's joint development agreement with DEC — which has a strong presence in engineering environments — has also added to Apple's appeal to technical users, Burdick added.

At the recent AEC Systems Show in Chicago, Autocad for the Mac II received significant attention from attendees, he continued. "It was pretty remarkable to see a line of engineers waiting to see Autocad running on the Mac," Burdick said, noting that he expects to see more CAD applications running on the Mac II. "Apple is giving people in that market a warm, cozy feeling that they're in this market to stay."

Wordstar

FROM PAGE 31

star package if it hopes to hold on to a huge installed base of defecting users.

Wordstar Release 5 reportedly contains 300 new features, including page preview capabilities, outlining, mail merge and an updated interface. The package costs $495. But the firm's troubles run deeper than one late product upgrade. Much of Micropro's current fiscal malaise stems from its traditional one-product approach to the market.

Branching out

Leon Williams, Micropro's president and chief executive, has tried to diversify the company to avoid dependency on one product, but preannounced programs have yet to hit dealers' shelves. Williams could not be reached for comment.

"Micropro hasn't introduced the new products needed to build new customers," said Bill Higgs, director of software research at Infocorp in Cupertino, Calif. "If they're going to leverage their current end users, they're going to have to broaden their product line."

Most notably absent from Micropro's product list is a word processor for Apple Computer, Inc.'s Macintosh and a desktop publishing package. The Mac package has already missed its shipment deadline and the desktop publishing program is still under development.

New product sales could inject some much-needed life into Micropro's bottom line. Although Williams was supposed to spark a turnaround at the one-time word processor king, Micropro lost $2.3 million on revenue of $10 million for the quarter ended Feb. 29, 1988. For the same period one year ago, Micropro posted a profit of $500,000 on revenue of $9.2 million.

Higgs, however, said the late shipment of Wordstar Release 5 does not necessarily mean the company is down for the count. "It's never surprising to hear that software is late — three months late might not make that much of a difference," Higgs said.

IBM's VGA inspires subsystem, monitor

BY JAMES A. MARTIN
CW STAFF

ATLANTA — IBM's Video Graphics Array (VGA) gained additional support at Comdex/Spring '88 here last week with compatible product introductions from Hewlett-Packard Co. and AST Research, Inc.

HP unveiled its Video Graphics Subsystem, which includes a VGA adapter card said to be register- and IBM BIOS-level compatible with IBM's VGA, with the choice of either a color monitor capable of displaying up to 256 colors simultaneously, or a monochrome monitor. The subsystem is designed for the HP Vectra line as well as IBM Personal Computers.

The adapter card comes standard with 256K bytes of random-access memory, with an option for 512K bytes, and an 800- by 600- pixel resolution.

HP's subsystem reportedly will be available June 1, at a cost of $445. The Video Graphics Color Display will be priced at $695 and the monochrome display will be priced at $250.

AST unveiled its Premium Display/VGA color monitor, said to provide up to 720- by 480-pixel resolution on a 14-in. diagonal, noninterlaced screen; it is slated for June availability for $696. The company said it will also release the AST-VGA Plus, a 16-bit graphics adapter said to run 400 times faster than IBM's VGA; it is scheduled to ship in late May for $599.

Symantec, Metier link project tools

BY STEPHEN JONES
CW STAFF

CUPERTINO, Calif. — Symantec Corp. wedged its Time Line personal computer project management software into the world of minicomputers and mainframes recently, announcing a plan to link Time Line with high-end products from Metier Management Systems, Inc.

Symantec and Metier teamed up to develop hooks between Time Line and Artemis Project, Metier's project management software, that allow users of either product to share data. The agreement also calls for a joint sales and marketing push and plans to link future products from both companies.

Time Line 3.0 users can transfer data to and from Artemis software by running a utility add-in disk that Symantec said it will ship as a free upgrade during the second quarter. Metier is currently shipping Artemis, which can import and export data from Time Line and starts at $3,500.

High-end links

The link to Artemis gives Time Line PC users a connection to project management software running on high-end workstations, Digital Equipment Corp. VAXs, Hewlett-Packard Co. 1000 series minicomputers and IBM mainframes, according to Rod Turner, Symantec's executive vice-president.

Time Line users can take advantage of that connection and send schedule data to high-end systems for project consolidation.

Turner said the partnership is aimed at taking advantage of the need to pass project information between high-end and low-end computers as PCs continue to be integrated into corporate mainframe environments.

"An end user can now transfer data down to the PC level so that others can manage part of a large project," Turner said.

Symantec is not the first software company to try marrying its PC project management program to another company's high-end software. Microsoft Corp., developer of Microsoft Project, already has a similar relationship with Primavera Systems, Inc.

3270 PC

FROM PAGE 31

"No one will miss the 3270," Jeffery said. "The thing was a dog from day one."

He said the G models of the 3270 line were "too limited to be general-purpose graphics workstations and too expensive to be general-purpose workstations. No one really bought them."

IBM credits the 3270's demise to the birth of its Personal System/2 line with the 3270 Connection Adaptor and supporting programs that offer 3270 functionality. IBM will continue to sell the three remaining 3270 models until June, according to IBM spokeswoman Linda Dezan.

User Art Skopec said the announcement was more than welcome. A senior PC analyst in the information center at Memorial Sloan-Kettering Cancer Center in New York, Skopec said he had not bought a 3270 for a year and a half. The center has approximately 50 of the units.

"We were one of the people to buy into them and learn that they were virtually a useless workstation," Skopec said. "They couldn't run DOS sessions of any consequence, especially with RAM-intensive applications like Paradox."

Ed Ginorio, manager of customer computing support at Dun & Bradstreet Corp. in Basking Ridge, N.J., said the fact that IBM will not be manufacturing the 3270 is not distressing. "The key is that the functionality is not being lost. That will just continue on in any of the new machines," he said. "We hadn't invested too much development time in terms of thinking that the hardware would last that long."

Skopec said the cancer center has used the systems for electronic mail with IBM's Professional Office System and as personal computer workstations for word processing and light spreadsheet and data base applications.

The center connected the machines via IBM's Host Connect to the mainframe.

"At every step of the way, the 3270s presented us with difficulties," Skopec said. For him, the death was long overdue. "They keep the turkeys around, then precipitiously, they get rid of two products that are adequately filling their niche — the XT and AT."

Skopec said his shop has nearly 800 PCs, and 50% are well connected to the host via Digital Communications Associates, Inc.'s Irma adapter.

IBM's Dezan said the 3270 hardware's maintenance and service support will continue indefinitely.

Unlock VAX Resources

With System 1032 Application Facility

System 1032/AF integrates everything on your VAX: VMS services, 4GL, existing 3GL modules. Integrate at the menu level or invisibly weave everything together inside an application.

CompuServe

Data Technologies
Tel: (617) 661-9440
DEXPO Booth #1122

Application Development Seminars

9 a.m. to Noon

See our 4GL-based application development environment in action at a free morning seminar. Call our Seminar Coordinator to reserve your spot.

CompuServe

Data Technologies
Tel: (617) 661-9440
DEXPO Booth #1122

Let's Stop All This Finger-Pointing And Get Down To Some Serious Name-Calling.

When something goes wrong with a computer system, everybody wants to know whose fault it is.

We have a better idea.

Solve the problem first. Point fingers later.

As the leading supplier of high performance peripheral subsystems for VAXs, we've seen our share of the unspeakable. But we've rarely seen the unsolvable.

We're not just talking about emergency service, either. Anyone can come in, smell smoke, and replace the offending device. We're also talking about things that are much more subtle. Like when your system is red-lined and it's still just too &@$%#! slow.

DEXPO SOUTH BOOTH #1147

DEC is a registered trademark of Digital Equipment Corporation.

We can look at a whole system and figure out what went south and why. Sometimes better than the people who built it.

You see, what our subsystems and services do best is make Digital Equipment's processors perform better.

And except for those people whose checks are signed "Olsen," we have more trained bodies *in the field* to back us up than any other company selling in the DEC marketplace.

So you want to call somebody names?

Call us. **800-333-2220.**

We'll solve your problems faster than you can say "System Industries."

SYSTEM INDUSTRIES

© Copyright 1988 by System Industries, 560 Cottonwood Drive, Milpitas, CA 95035.

OS/2

FROM PAGE 31

SAA, you don't participate in this evolution," Kamerer said.

The lack of highly detailed information concerning OS/2 Extended Edition, including unanswered questions about compatibility with non-IBM Personal Computers, has held back planning by some organizations that otherwise buy into the concepts.

Despite the questions, many corporations are including the application-strewn operating system into their sometimes vague plans for future systems. "For OS/2 Extended Edition, this is a year to understand and position it. But there will not be a lot of real implementation," said Julian Horwich, a PC manager at a Fortune 100 firm.

Others have a firmer handle on its use, if the product stands up to scrutiny. "If it does what they say it will do, it will play a big role in our shop. We have DB2, so we are hoping OS/2 Extended Edition fits in well for turning mainframe data into PC data and vice versa," said Howard Fosdick, relational data base project leader at Amoco Corp.

Although the lack of third-party support has tempered Extended Edition excitement, Kamerer promised that will change. "It will start at Comdex, and there will be more and more [support] by year's end," Kamerer said. He did not give specifics. Comdex/Spring '88 was held last week in Atlanta.

Dataease International, Inc. has been rumored to be prepping a front end for the IBM system, sources said. OS/2 Extended Edition will provide a variety of front-end tools, but observers believe the tools will lack the sophistication of those provided by third parties.

And though many users and vendors have focused on the DBMS portion, OS/2's host-oriented Communications Manager may hold the real allure. "When you are talking about real strategic systems with a high level of integration between a PC and a mainframe, it is really nice to have just one vendor," Fosdick said. "With multiple vendors, when you have a problem, they all point at each other and say it is the other guy's fault."

Overactive imagination

Because IBM has avoided direct answers up to now, the issue of whether Extended Edition will run on non-IBM PCs has loomed large. But the issue may be overblown. "If they are truly 100% compatible, sure it will run. In fact, a PC bus-based AT-like machine can make an excellent workstation," Kamerer said.

IBM has not tested OS/2 Extended Edition on competitors' machines, but one beta-test site has. According to the site, the software ran well on a Compaq Computer Corp. machine.

In addition, Phoenix Technologies Ltd. is confident that machines using the firm's A BIOS, a style of BIOS designed for OS/2 that also conforms to known hardware standards, will run the software as well. However, if a clone vendor's system is not hardware-compatible enough to run IBM's version of OS/2 , it is doubtful that the system will run the Extended Edition.

The initial markets for OS/2 Extended Edition are a set of customers interested in laying the groundwork for real-time access to data distributed across local-area networks, workstations, minis and hosts, Kamerer said. "The first people that utilize it and relate to it will be large mechandisers, large petrochemical firms and large banking institutions. And if you look at IBM's largest 100 customers, I would be surprised if any of them don't have it installed and are using it in a real-time environment by the end of this year."

For users unwilling to wait for more advanced links between Extended Edition and DB2, there are two alternatives. "You can use the query manager on the host, or you can create the query on OS/2 Extended Edition, use file transfer to go to the host, run the query on the host, take the results and file transfer them back down," Kamerer said.

Users looking to boot up Extended Edition had better look for a deal on hard disks and memory, as Kamerer recommends 6M bytes of random-access memory and at least a 30M-byte hard disk drive.

ABOVE ALL, THERE IS FREEDOM

Freedom is...having a communications network flexible enough to grow with your needs. A hybrid system that provides real and immediate solutions. Today. And in the future.

That's the beauty, (and freedom) behind Gandalf's MUX 2000 System. It's modular, so it grows with you.

When you need to increase your access to new resources and users, the appropriate modules can be added.

When you are ready to include transporting voice/data, statistical and time division multiplexing or X.25 packet switching transport, you just add a new card to your system.

And of course, as the revolution in networking continues and new technology becomes available, Gandalf will be there.

The MUX 2000 System. The intelligent, cost-effective networking solution.

The sky is the limit. To find out more about the MUX 2000 System, call or write for the complete brochure.

gandalf

Productivity through connectivity.

GANDALF DATA INCORPORATED
1020 South Noel Avenue
Wheeling, Illinois 60090
Phone: 1-800-GANDALF
In Illinois (312) 541-6060

NETWORKING

DATA STREAM

Patricia Keefe

Take the bull by its horns

The first of a two-part series dealing with EDI planning issues.

The promise of electronic data interchange (EDI) is so seductive and the potential rewards so sweet that it's easy to forget that the planning and execution is no piece of cake.

Restructuring the way an organization does business, no matter how small a change you start with, is bound to have repercussions — a few of them nasty. So you might as well be prepared.

Proponents of EDI will find themselves having to convince a much larger audience than usual. User departments, finance, MIS, telecommunications, upper management and outside trading partners must all be persuaded.

Possibly the easiest approach is to form a task force with representatives from all affected groups — especially the executive office. Without it, you'll be hard-pressed to make EDI happen in your firm, warns David Taylor, a program director at the Gartner Group in Stamford, Conn.

Just as important, you've got to have somebody take responsibility for EDI as it moves across the organization, Taylor adds. One way to do that is to make sure the project has the full backing of MIS and other key

Continued on page 52

X.25 market seen on upswing

Low cost, smooth integration get credit for healthy condition

BY PATRICIA KEEFE
CW STAFF

Despite any rumors to the contrary, the market for private packet-switching networks is healthy, vigorous and expanding, according to two recent reports on CCITT-standard X.25 technology.

Both users and vendors are increasingly turning to packet switching to resolve cost and internetworking issues, according to "The X.25 Private Packet Network," a report from The Yankee Group, based in Boston.

The report included the results of a survey of 34 users with large private packet networks, representing about 24% of the domestic installed base, the market research firm estimated. The primary reason given for using this technology was cost, followed closely by integration with the organization's existing facilities (see chart page 49).

Also high on the list of user selection criteria was interconnectivity, which The Yankee Group said will be a major factor in market growth. Users surveyed had extensive packet network links between their IBM Systems Network Architecture environments and with their local-area networks.

Budget bulge

Also, users said they are allocating large blocks of their data communications budgets to packet-switching networks. In 1987, that meant 38.1% of the average user's datacom budget, which is expected to rise to 43.1% next year. Of the users surveyed, 69% reported communications budgets greater than $15 million.

The larger the network, the greater the percentage of a user's communications budget committed to packet-switching technology, the report concluded. Given the higher financial stake in seeing the network perform, vendors can expect users to place increasing demands on suppliers, it added.

The Yankee Group projected that private and hybrid packet networks will experience a compound annual growth rate of 25% domestically. Total revenues from the building of private and hybrid packet-switched networks by both vendors and users are estimated at approximately $984 million in the domestic market.

A second report, "The X.25 Industry," projected domestic sales of X.25 network equipment to grow at an average compound rate of 28% annually through 1991, as industry revenues grow from $320 million in 1987 to $780 million. The report is published by Able Telecommunications, Inc., a telecommunications consulting and research

Continued on page 49

CSI tool supports IBM DDM

BY KATHY CHIN LEONG
CW STAFF

SAN JOSE, Calif. — Communications Solutions, Inc. (CSI) has introduced a file access package said to allow AT&T Unix System V-based workstations to support Distributed Data Management (DDM), IBM's architecture for remote file access.

CSI, which is known as a purveyor of IBM Systems Network Architecture (SNA)-compatible software and services, claimed its Access/DDM enables users to tap record-based files that reside on IBM and non-IBM computers on an SNA network.

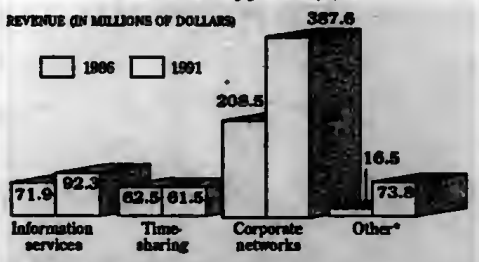
Prior to CSI's answer to remote access, IBM offered DDM/PC, a software product that runs only on Microsoft

Continued on page 48

Data View

Value-added network segments forecast

Corporate nets will gain steam in revenue while time-sharing growth stays flat



* Includes emerging services such as billing, electronic data interchange, credit authorization and data base services

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

Pacific Bell to furnish LAN

BY KATHY CHIN LEONG
CW STAFF

SAN FRANCISCO — After a successful one-year test at the California Department of Water Resources, Pacific Bell will begin offering its central office-based local-area network to business users in California this month.

The network service is based on Centrex and will integrate voice and data over standard telephone wire leading up to a Pacific Bell central office.

Pacific Bell, a subsidiary of regional holding company Pacific Telesis Group, also recently announced plans to offer vendor licenses for its Project Victoria technology following beta testing.

Known as the poor man's Integrated Services Digital Network, Project Victoria allows users to run voice and data over standard telephone lines from a single multiplexing device. The

Continued on page 48

Inside

- Ungermann-Bass adds VAX support to Net/One. Page 49.
- Tiara card links PS/2, Ethernet LANs. Page 53.
- Western Digital adds net analyzer. Page 53.

Modems, Multiplexers, and Much More...

Warning: Bargains can be hazardous to your network.

Some people feel that price is the only thing that matters when it comes to modems. Our customers feel differently. If you also feel that quality, support and company stability are just as important as price, we offer you our 2400/1200 bps error-correcting MultiModems,™ in desktop, internal PC and rack-mounted versions.

And if your network is ready for multiplexing, we offer our MultiMux™ 4- and 8-channel statistical multiplexers.

MultiModems and MultiMuxes are manufactured in Minnesota by Multi-Tech Systems (as they have been since 1970), and provide exceptional quality at an economic price. If you are not already a Multi-Tech modem or mux user, please call us toll-free today, at

1-800-328-9717.

MultiTech Systems

Multi-Tech Systems, Inc. • 82 Second Avenue S.E. • New Brighton, MN 55112 • (612) 631-3550 • (800) 328-9717 • FAX 612-631-3575 • TWX 910-563-3610

Pacific Bell

FROM PAGE 47

patented device provides seven channels — two for voice and five for data — and allows access to one 9.6K bit/sec. data channel and four 1,200 bit/sec. channels, a Pacific Bell spokesman said.

Although Project Victoria has encountered some resistance from the Federal Communications Commission, Pacific Bell's networking service was recently approved by the California Public Utilities Commission, which will allow the telephone company to charge $22 per month per workstation at a speed of 9.6K bit/sec. A $24 charge per workstation will give users faster speeds of 19.2K bit/sec. There are additional charges for users who want to interface the network to T1 links or to other transmission media.

The Pacific Bell LAN will support users located in several buildings over a maximum of 3½ miles, from the customer premises to the central office.

Catching on

As a result of deregulation, the Centrex-based LAN service is one of the hottest trends among the phone companies, which have been anxiously awaiting the opportunity to offer data services to a captive user base.

Pacific Bell will be pitching the network to users who prefer not to hassle with network maintenance and support. The network reportedly does not require new cabling and will have 24-hour, seven-day-a-week maintenance. A Gandalf Data, Inc. voice/data multiplexer is the only piece of hardware required at each workstation.

Bruce McCaleb, Pacific Bell's LAN product manager, explained that any asynchronous terminal or microcomputer emulating an asynchronous terminal can be networked. The user does not need to use a file server but does need to have a communications package for each PC.

Project Victoria has been under fire because of its requirement for a multiplexing box that the FCC considers customer-premise equipment (CPE). Telephone firms are not allowed to manufacture or sell CPE.

Awaiting a response to its appeal to the FCC, Pacific Bell said it cannot wait any longer and will sell licenses to vendors that want to make and sell the multiplexing box and related hardware located at the central office.

If the FCC approves, Pacific Bell said it will offer Project Victoria as a service. Business applications will include data base searches, bulletin board services, file and burglar alarm monitoring and remote banking. Currently, the only licensee of the technology is CWA Communications Products, Inc. in Saratoga, Calif.

CSI

FROM PAGE 47

Corp. MS-DOS machines.

Access/DDM essentially performs a global search for a record or file and brings the data down to the user workstation, according to the vendor. Written in C, the remote access software reportedly can be configured by the user or vendor to support MS-DOS and OS/2 or any other operating system.

Access/DDM follows IBM's DDM application programming interface so users can create applications for sharing these files across mainframes, minicomputers and personal computers, the vendor said.

The product is also said to support the specifications outlined by IBM for either the request-originating workstation or the receiving node.

To date, IBM has brought support for DDM under the IBM System/36 and 38, with the IBM CICS/VS environment serving as the only target node.

Access/DDM features bidirectional file transfer and record access and contains a DDM network resource directory that lists where each file resides.

John Pickens, CSI's director of communications architecture, said IBM is placing a high priority on the success of DDM. The DDM file transfer protocol is used in IBM's NetView/PC, he added.

Available now, CSI's Access/DDM is sold as a source-code product and is licensed to users and vendors.

SQL Performance for OLTP.

Tandem challenges anyone.

Ungermann-Bass to support VAX on Net/One

BY JAMES DALY
CW STAFF

SANTA CLARA, Calif. — Ungermann-Bass, Inc. recently added support for Digital Equipment Corp.'a VAX environment to its Net/One network family.

Ungermann-Bass's a new network interface card is said to integrate personal computer network services into a VAX.

The Net/One NIU-DHA does double duty by giving users the ability to access the VAX either asynchronously or as Microsoft Corp. MS-Net disk and print servers, the vendor said.

In turn, the NIU-DHA reportedly allows a VAX host to act as a Net/One print and disk server, enabling PC users to access applications and data bases on the VAX using Microsoft MS-DOS commands. PC files are stored on VAX disks as virtual MS-DOS disks.

PCs emulating DEC VT100-, VT200- and VT300-class terminals connected through Ungermann-Bass terminal servers such as the Access/One, NIU-180 or NIU-130 can gain access to the DEC VAX/VMS environment, the vendor said. Access to VMS-based applications can be made with both Q-bus and Unibus-based VAXs.

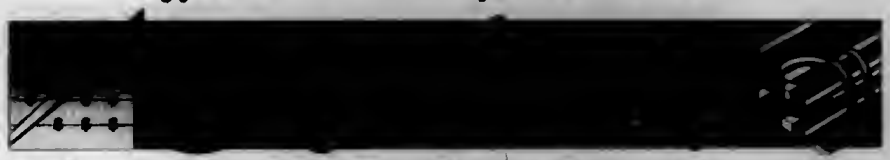
Up to 26 32M-byte disks can be shared. Data base file sharing is supported via standard MS-DOS and MS-Net features for multiuser applications, such as Ashton-Tate Corp.'a Dbase III.

The NIU-DHA is available immediately and ranges in price from $6,000 to $24,500, depending on configuration.

PRODUCTIVITY PLUS PERFORMANCE. NonStop SQL™ — the only SQL system that delivers OLTP performance. It's embedded right into the operating system. This is where the work is done, allowing the application to run at OLTP speed. You get a distributed RDBMS with the productivity, performance and data integrity that OLTP demands.

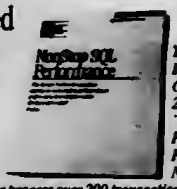
DATA INTEGRITY. DISTRIBUTED PROCESSING. MODULAR GROWTH. Users can read, write and update data anywhere in the Tandem network with full data protection. The database will always reflect the current state of business. You can grow the system to any size, in any increment. Yet to the user, the entire database will look like a local database.

OLTP fundamentals.
If you don't have them all, you don't have OLTP.



PRICE PERFORMANCE | NETWORKING | DISTRIBUTED DATA | LINEAR EXPANDABILITY | DATA INTEGRITY | SECURITY | FAULT TOLERANCE

NO ONE KNOWS OLTP LIKE US. Whenever there's a need for constantly current information, linear expandability and excellent price/performance, Tandem technology proves consistently superior. Compare us to any other OLTP system. You'll see why companies in every major industry choose Tandem. For more information, call 800-482-6336.



THE BENCHMARK. Call for this free, 20-page report: "NonStop SQL Performance." Four 8-processor NonStop VLX™ systems process over 200 transactions per second with a response time of two seconds or less. The report sets a new standard for full benchmark disclosure.

TANDEM COMPUTERS
OLTP is On-Line Tandem Processing.

C316S

X.25 market

FROM PAGE 47

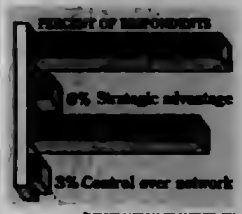
firm located in Milpitas, Calif.

Able tagged network management as the fastest growing segment in the X.25 equipment market. Sales are expected to increase from the $45 million in 1987 to $70 million this year — and to $200 million in 1991.

The largest sector of the market is still packet switching, according to the Able report, and 1988 sales are expected to hit

How users justify private packet nets

Cost and integration have replaced control as leading factors



INFORMATION PROVIDED BY THE YANKEE GROUP
CW CHART

$260 million, up from $200 million last year. By 1991, the research firm expects sales to increase to $380 million.

Growth factors

The Yankee Group attributed some of the anticipated market growth to three issues:

- Internetworking. Packet switching is emerging as a cost-effective linking medium between disparate networks, the report said. "We see this process gaining momentum."
- T1 and T3 backbones. The Yankee Group predicts a major trend will evolve in which packet switching will develop a cooperative modus operandi with T1 networking. New technologies reportedly will allow these technologies to merge in many applications.
- Integrated Services Digital Network (ISDN). Acceptance and implementation of ISDN will exert a strong, positive, but currently unquantifiable impact on the private packet-switched network market, the report said.

Packet-switching networks will continue to show strong growth even in the presence of these technologies, the report predicted.

For years we've been network management p a revolutionary networ

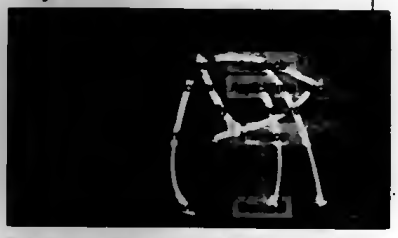
Back in 1978, Codex introduced the first independent network control system. And since then we've been busy introducing one network management innovation after another.

Now it's time for another revolutionary innovation. But this time, it's not simply a new network management product we're developing. It's an entirely new network management concept.

A concept unlike anything you've ever seen before. And a concept you've needed for quite some time.

Why a New Concept?

In today's multi-technology environments, even the best of today's traditional schemes can't keep pace with user demands for comprehensive network reliability, serviceability, and growth. That's because no single system has ever been able to address universal network management requirements.



When your network is simple, so is managing it. But when it grows with multiple technologies, most network management systems simply run out of steam.

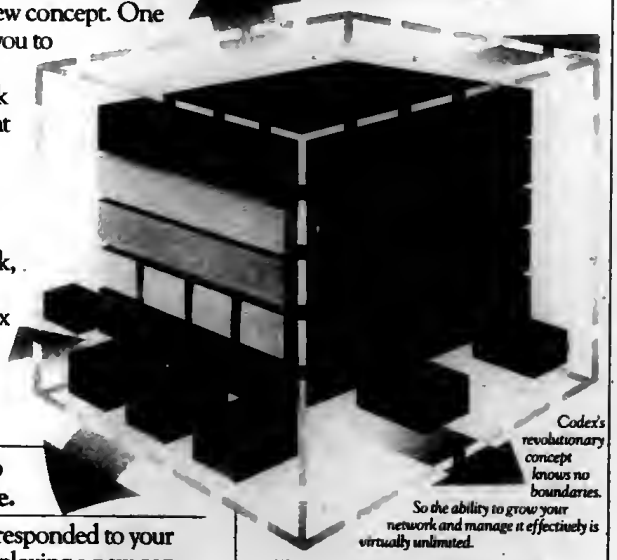
To get maximum network performance in these complex environments, a new level of integration is required. Which requires a new concept. One that allows you to address current network management needs, yet ensures you of optimum control over your network, no matter how complex it may be, or may become in the future.

Codex to the Rescue.

We've responded to your needs by employing a new concept to optimize your overall network's performance.

The result is a revolutionary system that's modular, incredibly easy to use, and offers an extraordinary user interface that provides an integrated systems view of your entire network.

To accomplish this, we've moved from today's proprietary era to our new direction for the entire network management industry. By creating a system based on user demands for open architecture in a standardized environment.



Codex's revolutionary concept knows no boundaries. So the ability to grow your network and manage it effectively is virtually unlimited.

A System Architected for Growth.

Our new system is designed to incorporate the future, accommodating new networking applications as they are developed. That's because it's based on open architecture technology, consistent with emerging OSI standards. Which provides unmatched user flexibility, and unmatched potential for growth.

Within our new network

© 1987 Codex Corporation. Motorola and Ⓜ are trademarks of Motorola, Inc. Codex is a registered trademark of Codex Corporation.
Sales offices in more than 40 countries worldwide. In Europe call 32-2-6608980, in Canada 416-793-5700, in the Far East 852-5-666706 (in Japan 81-3-5840810), in the Americas 617-364-2000.

introducing innovative roducts. Now it's time for k management concept.

management concept, all network devices are treated consistently. In fact, it defines a relationship between all network devices and the management system – a relationship never before established. So one system will handle all architected devices, as well as give you the structure to manage unarchitected devices.

Standards Are the Roadmap.

As protocols and applications proliferate, the demand for standardization is greater than ever before. Everyone is talking about standards – they're critical to the future because they facilitate integration, choice and flexibility.

As the leading proponent of vendor-independent networking, Codex has always been an active

No matter what your networking needs, Codex has the solutions.

contributor to the evolution of network management standards. So naturally, we designed our integrated network management system to be fully consistent with emerging OSI standards.

True Integration Is Here.

With our new concept, you'll be able to get one consistent view of the entire network topology.

With a single management system you'll have the potential to manage and control your entire network – statistical and time division multiplexers, T1 muxes, modems, X.25 concentrators – and other network devices. And that includes access to your computing equipment.

And we've engineered a non-proprietary technology that can work with other systems – in conjunction with IBM's NetView, for example – to give users truly integrated control of their network.

This level of control allows you to *take decisive corrective action* to optimize network performance. Because the information and the management commands for your entire network are integrated and provide a unified database, one system provides full problem, fault, event and performance management – with extensive diagnostic, restoral, reconfiguration and reporting capabilities to maximize overall network availability.

Our new network management concept allows you to control your network no matter how far it reaches.

Call For More Information.

Obviously, there's lots more to tell than this space allows. To obtain a free brochure outlining our revolutionary approach to network management, call **1-800-426-1212, Ext. 246.** In Europe, call 32-2-6608980. Or write to Codex Corporation Dept. 707-46, Maresfield Farm, 7 Blue Hill River Road, Canton, MA 02021-1097. We promise it will change the way you look at network management forever.

codex

MOTOROLA

The Networking Experts

See us at ICA, Booth 1480

Keefe

FROM PAGE 47

company executives.

Without the involvement of MIS, you run the risk of reliving the early days of the personal computer and local-area network juggernauts, forced to cope with user departments that are willy-nilly installing whatever suits their fancy.

The incompatibility nightmare between EDI systems — never mind the already-installed corporate computer architecture — cannot be tolerated. "Wouldn't you like to have the same interfaces to EDI, the same subsets of the ANSI-standard X12 and the same software vendors companywide?" Taylor asks.

EDI proponents will have to convince a much larger audience than usual.

If these appeals to reason fail, Taylor recommends bypassing MIS, going straight to the executive office and laying it on the line: "Look, we'll lose this business if we don't do this." EDI can function as a strategic tool. Customers will migrate to whatever supplier can meet orders and accommodate changes the fastest. Time is money.

"We tell MIS to take the bull by the horns; view EDI as a chance to demonstrate some bottom-line value to headquarters. There is no one else in the company who is in a better position to turn this kind of technology into a competitive advantage," Taylor says. The alternative is to have an EDI mandate attached to an unrealistic schedule that threatens MIS jobs. "So why not use this opportunity to become a hero?"

Top-down help

Also crucial is upper management support. "Without a corporate approach, EDI basically becomes a department manager's toy," Taylor adds.

The best way to ensure management's support is to talk bottom line — money, of course.

But the proper way to cost justify EDI is to do pre- and post-EDI implementation analyses. Taylor says he is constantly amazed at the number of large EDI installations that have no idea how much money their systems are saving — or costing — them. "How can you know how much you've saved if you didn't know what the paper system was costing you?" he asks.

But to achieve payback, EDI has to do more than just electronically emulate your current order processing system. True cost savings are realized through elimination of personnel, reductions in the number of steps or documents in a cycle and faster turnaround time in meeting orders and changes. These changes are the reason user departments absolutely must be involved in EDI planning, according to Taylor.

To be cost-effective, the EDI technology chosen must also fit in with the current and planned corporate architecture. Taylor predicts EDI vendors will begin shipping products that are compatible with IBM's Systems Application Architecture and the Open Systems Interconnect model in two years. And he urges users to query vendors on their plans to support these and any other standards considered key to the company's computer plans.

Obviously, this list only scratches the surface of potential EDI obstacles. The primary point to remember is that EDI issues tend to be more organizational than technological.

Don't forget, you've got to basically change the way user organizations go about their particular procedure, and that involves a lot more than than just substituting an electronic version of paper.

But with careful planning and a little foresight, there's no reason EDI proponents can't navigate their way past internal politics and budget battles to a successful implementation.

Keefe is a *Computerworld* senior editor, networking.

You won't get much glory without power.

That's why Motorola created LIfE. The Linked Information Environment. A group of integrated applications that gives your workgroup the kind of computing power it can't get from single-user tools.

LIfE

Because LIfE works

Power Is The Re

NEW PRODUCTS

Local-area network hardware

An adapter card connecting IBM Personal System/2 Models 50, 60 and 80 to 10M bit/sec. Ethernet local-area networks is available from **Tiara Computer Systems, Inc. Lancard E-II** is compatible with Novell, Inc. Netware and offers I/O mapping capability.

An optional boot programmable read-only memory allows any workstation to boot from a network hard disk located at another computer on the network. According to the company, Lancard E-II runs 15% faster than Ethernet cards using other technologies.

Lancard E-II sells for $725.

Tiara Computer Systems, 2700 Garcia Ave., Mountain View, Calif. 94043. 415-965-1700.

Data Race, Inc. has announced its **Office Communication System**, a combination of five connectivity functions on an expansion card for the IBM Personal Computer AT, XT, Personal System/2 Models 20 and 30 and compatibles.

Functions of the product include IBM Systems Network Architecture micro-to-mainframe communications, high-speed dial-up asynchronous communications on a Digital Equipment Corp. VAX, file transfer between CPU's, sending and receiving facsimile transmissions and linkup with The Source, Newsnet, or Western Union Corp.'s Easylink.

Pricing for Office Communication System starts at $595.

Data Race, Suite 108, 12758 Cimarron Path, San Antonio, Texas 78249. 512-692-3909.

Local-area network software

Brightwork Development has introduced a product that provides local-area network users peer-to-peer access to other personal computers on the LAN for modem sharing.

In addition to modem sharing, **Single Server Netremote** reportedly can access files stored on a local hard disk, run a plotter and control a LAN-based facsimile gateway from any point on a LAN.

Single Server Netremote can be licensed for use on a PC LAN with one server for $295.

Brightwork Development, P.O. Box 8728, Red Bank, N.J. 07701. 201-530-0440.

Open Systems has released a local-area network version of its Harmony Combined Accounting and Business Software for IBM Personal Computers, 100% compatibles and Tandy Corp. 1000, 3000 and 4000 systems.

Harmony Version 2.1 offers multiuser data sharing and provides multiple levels of passwords, record directories and file locking.

The product consists of 12 modules, including general ledger, accounts payable, accounts receivable, payroll, order entry and inventory. Workstations for LANs require DOS 3.1 or higher and 640K bytes of memory.

Harmony modules are priced from $99 to $999.

Open Systems, 6477 City West Pkwy., Eden Prairie, Minn. 55344. 612-829-0011.

Network management

Western Digital Corp. has announced a network analyzer program, **Lanwatch**, for its Ethernet and Starlan adapters.

Operating with Western Digital's local-area network cards, Lanwatch converts a personal computer into a network analyzer for monitoring networks and debugging protocols. A filtering option lets users preselect criteria for packets to be analyzed. Lanwatch can be customized to understand any protocol. It runs on the IBM Personal Computer, PC XT, AT and Personal System/2 Models 25 and 30.

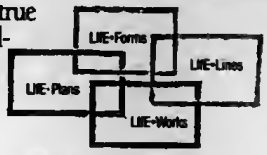
Lanwatch costs $1,195.

Western Digital, 2445 McCabe Way, Irvine, Calif. 92714. 714-863-0102.

the way workgroups do. Dynamically. Interactively. Cooperatively. And it has all the tools they need to reach their full potential—novices and power-users alike.

For instance, LIfE•Forms. A high-performance procedure automation tool that works like the business forms you already use. But LIfE's forms are intelligent, with commands and instructions built into them. Like formulas in a spreadsheet. Which gives your workgroup the power to develop many of its own applications.

LIfE•Plans. A true multi-user spreadsheet. Easy as 1-2-3.* But powerful enough to juggle a dozen databases simultaneously. Anywhere in the network. In mainframes, minis, LANs or PCs.



LIfE is a powerful group of integrated applications that work together the same way workgroups do—dynamically, interactively and cooperatively.

LIfE•Lines. A high-velocity electronic mail module that accelerates communications within your workgroup. And with other workgroups, wherever they may be.

LIfE•Works. A data-entry module powerful enough to make most dedicated transaction-processing systems blush.

And it all runs on some of the hottest hardware around. A multi-user supermicro built around today's most powerful microprocessors—the Motorola 68000 family. With an open architecture that lets your power-users enjoy LIfE wherever they want. On whatever they want—from laptops to mainframe terminals.

For a look at LIfE in real life, call 800-556-1234, Ext. 165. In California, 800-441-2345, Ext. 165.

And more power to you.

MOTOROLA
Computer Systems

10700 North De Anza Boulevard, Cupertino, CA 95014

© 1988 Motorola Computer Systems. Motorola Computer Systems is a subsidiary of Motorola, Inc. Motorola and the Motorola logo are registered trademarks of Motorola, Inc. LIfE is a trademark of Motorola Computer Systems, Inc. 1-2-3 is a registered trademark of Lotus Development Corporation.

al Spice Of LIfE.

Even if Bill's ditch digger doesn't get you, lightning will. Or ice storms. Or squirrels.

The fact is, you can't afford to expose your systems to erratic outside power.

Even a minor disturbance in power undermines your ability to provide systems availability. Sidelines your best people. And erodes management confidence.

Backhoe Bill Is About To Give Another Systems Group A Memorable Afternoon.

Enter Powerware™ Systems. Utterly reliable power solutions only from Exide Electronics. Cool, quiet, compact and cost-efficient. Configured for virtually all installations. Backed by the strongest customer support group in the industry.

And expressly designed to keep folks like Backhoe Bill out of your status reports.

Call 1-800-554-3448 for more information on Powerware™ Systems and the company that stands behind them. In North Carolina, please call 1-800-554-3449.

EXIDE ELECTRONICS Raleigh, North Carolina

HARD TALK

Stanley Gibson

Will desk top stop DEC?

At DEC product rollouts these days, company President and Chief Executive Officer Kenneth Olsen has taken to mentioning that DEC got its start by putting computing power in the hands of the users — by fostering interactive computing.

He then elaborates that what was initially — and still is in the vast majority of cases — the best way to do this was with time-sharing systems, namely mid-range or departmental systems such as those DEC sells.

Olsen implies that microcomputers are more difficult to use than they are cracked up to be. (Probably true.) In the past, he has also criticized the computers as less reliable than larger systems. What the user wants, Olsen says, is a time-shared terminal on his desk that he doesn't have to think about.

No doubt Olsen is right in s lot of instances.

Listen closer

But what about that phrase — "putting computer power in the hands of the user"? Doesn't that sound like he is talking about personal computers? After all, what puts computing power more directly in the hands of s single user than s PC?

Even though DEC's time-shared networked solutions may he excellent, many users want power on *their* desks. That is why PC sales and local-area networks have been seeing steady increases while minicomputer sales have seemed comparatively stagnant.

But PCs have not been DEC's strong suit. Its weakness in that area forced the company into an alliance with Apple. Its Network Application Support strategy, announced several months ago, will be a good corporate glue when all the pieces are present.

With this strategy, DEC says, "Whatever's on the desk top, we will support." It is as if to say "We are everything but what's on the desk top. What's there, whether it's MS-DOS, OS/2 or the Macintosh, we will

Continued on page 58

Hospital cures paper plague

Community medical center chooses optical system to organize work flow

BY ALAN ALPER
CW STAFF

NEW YORK — A community hospital here is installing an optical disk-based storage and retrieval system that provides instantaneous access to patient admission, billing information and medical records from networked workstations.

Maimonides Medical Center, s 700-bed, nonprofit hospital serving the Borough Park section of Brooklyn, is counting on the storage and retrieval system to make its operations more efficient by reducing reliance on paper. Microfilm was initially used to relieve the hospital's paper glut, but it has proven too tedious and inefficient to work with, hospital officials said.

"We're just inundated with paper," noted Bill Dipple, Maimonides' assistant director of finance, pointing to New York state laws that mandate the retention of patient financial records for six years and health records indefinitely. "We just plain ran out of space to put it all."

Cost comparison

Without the optical-based storage and retrieval system, the hospital would have had to rent warehouse space — costing at least $18 per square foot — to store the mountains of paper it generates, Dipple maintained. "We're investing $400,000 in this system," he said. "That's not expensive if you measure it against the cost of warehouse space over time."

Maimonides contracted with Advanced Graphic Applications, Inc. (AGA), s New York-based systems integration firm, to build the system. AGA has developed software that manages the flow of information throughout an organization — be it data, image or voice — using write-once read-many optical devices as the primary storage medium.

AGA installed an Ungermann-Bass, Inc. token-ring network at the hospital to provide shared access to admission records from IBM Personal Computer AT or Personal System/2-class machines over twisted-pair wiring. The network will eventually be used to facilitate voice messaging of test results from the radiology laboratory to attending physicians, Dipple said.

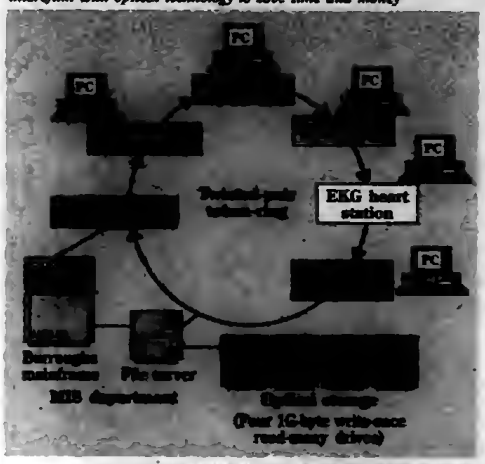
Already, 28 of the expected 132 nodes of the network have been installed, AGA Executive Vice-President Stanley Marder said. In operation since Nov. 1, the network currently links five locations: administration, cashiers, financial services, patient accounting and the computer room. About 16,000 patient records have been created with the system.

The hospital intends to link its radiology and cardiology depart-

Continued on page 58

Hospital goes optical

Maimonides Medical Center is replacing paper files and microfilm with optical technology to save time and money



INFORMATION PROVIDED BY ADVANCED GRAPHIC APPLICATIONS, INC.
CW CHART: FRANK C. O'CONNELL

Inside

- DEC cuts disk drive prices by up to 51%. Page 56.
- Intel memory modules allow processor board users to up system memory. Page 58.

Mips multiuser machine targets commercial market

BY J. A. SAVAGE
CW STAFF

SUNNYVALE, Calif. — Instead of flirting with business applications for reduced instruction set computing (RISC) architectures, Mips Computer Systems, Inc. is attempting s serious relationship by introducing s 12 million instructions per second (MIPS) multiuser system aimed at the commercial marketplace.

Mips is counting on its compiler technology to allow its OEMs to bring their general-purpose business applications to its RISC-based system. The Mips system uses the vendor's 18-month-old R2000 chip.

"The key part of RISC is optimizing Unix for RISC and optimizing the compilers," said William Jobe, Mips' executive vice-president.

The system, set for shipment next month, is called the M/120 and will he available in 9- and 12-MIPS versions. According to the company, s 12-MIPS machine — with 24M bytes of main memory, 320M bytes of disk storage, an Ethernet controller port and software, s small computer systems interface bus and four card slots that accept IBM Personal Computer AT bus controllers — carries s retail price of $43,500.

A system with 32M bytes of memory and 1G byte of disk storage is priced at $66,000, the vendor said.

'A better RISC chip'

Sandra Gant, an analyst at Cupertino, Calif.-based Infocorp, said the Mips microprocessor used in the systems is superior to others on the market, including the Sun Microsystems, Inc. Sparc chip.

"From an engineering standpoint, it's s better RISC chip," she said.

Gant added that Mips is migrating away from the merchant semiconductor business. "They want to be s systems company."

DG brings new power to low end

BY STANLEY GIBSON
CW STAFF

WESTBORO, Mass. — Data General Corp. recently added s follow-on to its Desktop Generation of low-end multiuser systems. The 16-bit DG/500, housed in s personal computer-type chassis, is said to be software-compatible with DG's RDOS-based Desktop Generation MV/1400 and MV/2000 systems.

The DG/500 uses a proprietary CPU chip and runs the RDOS operating system. The system can support up to 2M bytes of memory and 160M bytes of disk storage. The speed of the CPU chip was increased from the Desktop Generation's previous 500 nsec to 380 nsec in the new system.

The DG/500, priced at $4,995, offers a savings of 30% compared with its predecessor, according to Stan Dolberg, manager of DG's integrated systems group.

Subsystem announced

In addition, DG introduced s storage expansion cabinet called the Combined Storage Subsystem for its MV/1400 and MV/2000 systems running the vendor's AOS/VS operating system.

Priced from $11,100, the subsystem consists of s 234M-byte Winchester disk drive and s 130M-byte cartridge tape drive. The subsystem can contain up to four disk or tape units, according to the vendor.

Dolberg said the expansion cabinet allows the MV/2000 to support up to 64 users, compared with a previous maximum of 24.

DG also announced an 8M-byte memory expansion board for the MV/1400 that allows memory growth to 12M bytes. The memory board is priced at $5,500.

All the products will be available in 30 days, according to the company.

DEC drops disk drive prices

MAYNARD, Mass. — Digital Equipment Corp. recently cut the prices of several of its disk drives by amounts ranging from 19% to 51%.

DEC reduced the price of the 5¼-in. RD54, which offers 159M bytes of formatted storage capacity, by 38%. It now costs $4,500. DEC also reduced the price of the 5¼-in. RD32 drive with a formatted capacity of 42M bytes by 33%. The RD32 now costs $1,615.

The RX33 flexible diskette drive with a formatted capacity of 1.2M bytes has been reduced by 51% to $388.

In addition, DEC reduced its SA482 and RA82 products by 19% to 28%.

DEC's four-spindle SA482-AA/DD drive, which offers a formatted capacity of 2.49G bytes, is now available for $66,000. The three-drive SA482-LA/LD, which offers 1.87G bytes of formatted storage, is now available for $51,000. The two-spindle SA482-HA with 1.24G bytes of formatted storage capacity is now priced at $34,000.

The RA82-EA/DE is now available for $51,000. It has 1.86M bytes of formatted capacity. The RA82-DA/DD with 1.24G bytes of formatted storage is available for $34,000, and the RA82-CA/CD, which offers 622M bytes of formatted capacity, is priced at $17,000.

Point 4 puts RISC in deskside arena

TUSTIN, Calif. — Point 4 Data Corp. has unveiled a deskside, 128-user, 15.6 million instructions per second (MIPS) minicomputer. Point 4 also released a 6.25 MIPS model in the same deskside form.

Both models, to be sold through Point 4's value-added resellers, are aimed at business users, the vendor said.

The new computer has a smaller footprint than previous models and supports 5¼-in. disk drives. Earlier models support 8-in. peripherals.

The new models are based on a proprietary reduced instruction set computing (RISC) architecture and are supported by Point 4's Iris operating system.

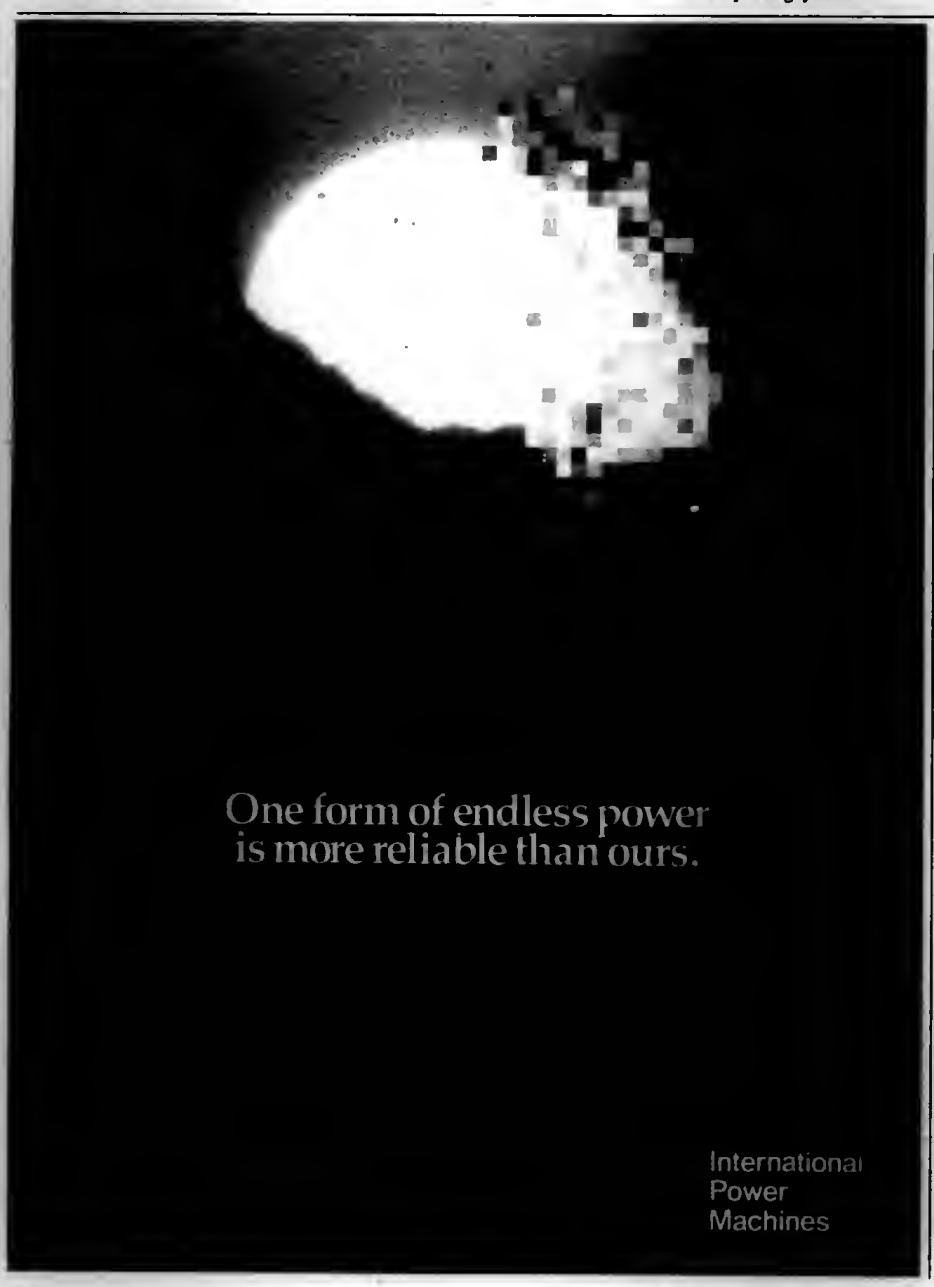
The more powerful machines in the company's line of multiuser systems use Point 4's RISC architecture. However, they can run software written for the non-RISC-based low-end systems in Point 4's product family, a Point 4 spokesman said.

The Mark 6E, at 6.25 MIPS, has 2M bytes of memory and a 170M-byte Winchester disk drive; it can operate at 160 nsec.

The suggested retail price for a typically configured base model of the 6E is $29,000.

The 15.6-MIPS computer, the Mark 12E, has 2M bytes of memory, a 170M-byte Winchester disk drive and operates at 64 nsec.

The suggested retail price for a typically configured base model 12E is $39,900.



Storage Tech brings tape to Unisys users

LOUISVILLE, Colo. — Storage Technology Corp. recently brought an IBM 3480-type cartridge tape subsystem to Unisys users by announcing the 4780 subsystem.

The 18-track 4780 was designed to run with Unisys 1100 series mainframes and operating systems, but it is also compatible with IBM mainframes. The 4780 can be shared by multiple 1100 processors, the vendor claimed.

Storage Technology had previously offered a nine-track tape drive, the 4770, for Unisys 1100 users.

Each of the 4780's drive frames contains either two or four transports, which minimizes the subsystem's footprint, the vendor said.

A subsystem consisting of two control units and two drive units containing four drives each lists for $292,000. General availability is slated for the third quarter.

Storage Technology said it will jointly market the 4780 with Systems Leasing Corp., a leading Unisys lessor.

Low-end Zebra now on the loose

ANAHEIM, Calif. — General Automation, Inc. recently added to the low end of its Zebra line of multiuser systems, announcing the Zebra 1620.

Designed for eight to 16 users, the Pick Systems-based machine brings a CPU using the 12-MHz Motorola, Inc. 68020 microprocessor to entry-level Zebra users.

The Zebra 1620 is software-compatible with all other Zebra models. In addition, it is field upgradable to the more powerful Zebra 1820.

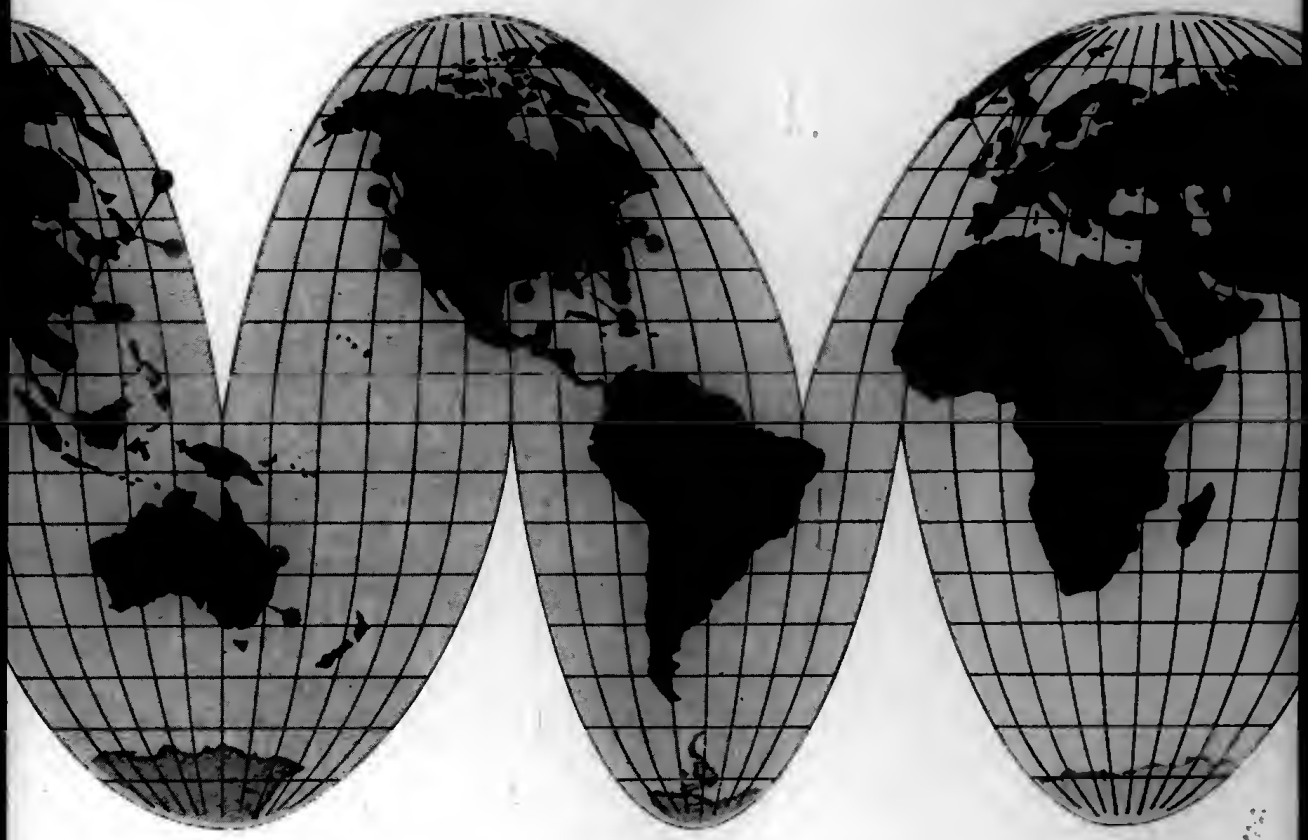
The system is available with 1M to 2M bytes of memory, 40M or 67M bytes of disk capacity and a 45M- or 67M-byte streaming tape drive.

The suggested retail price for the Zebra 1620 is $12,500.

WHERE IN THE WORLD CAN YOU GO FOR COMMUNICATIONS PRODUCTS AND SERVICES?

NYNEX is one of the leading information management companies in the world. We're a company with a 100-year heritage in communications and over 90,000 employees. A company with $12 billion in revenues, $22.8 billion in assets. NYNEX, builder of public and private networks, a leader in cellular communications, information systems, software and directory publishing. NYNEX, with offices in 14 countries, is a world-wide communications resource.

Come to Booth 2040 at the International Communications Association Conference and Exposition at the Anaheim Convention Center in Anaheim, CA, May 17-19 to find out more about NYNEX.



THE ANSWER IS NYNEX

Telecommunications • Information Systems • Software • Publishing • Business Services

© NYNEX Corporation 1988

Hospital

CONTINUED FROM PAGE 55

ments, located within a two-block campus, to the network using modems and existing twisted-pair telephone wiring. "We need to be able to see everything from a single point," Dipple explained. "We need to see where a patient has been during his stay in the hospital. This eliminates all the hunting" for records.

Upon admission, all of a patient's vital information, including medical history and insurance, is entered into a Burroughs Corp. Model 3955 mainframe. Each evening, after midnight, the information from the mainframe is downloaded onto tape in batch mode and into the network's file server via a tape-to-tape transfer.

Patient information written on paper can also be entered into the optical disk-based storage and retrieval system from various locations throughout the network using scanners attached to workstations. AGA created a data base management system using Ashton-Tate Corp.'s Dbase III Plus and Nantucket Corp.'s Clipper that groups related data and documents in patient files.

Optical prescription

Ultimately, the hospital hopes to create an interface that would enable data to be automatically transferred from its mainframe to the optical system. In addition, it is considering using optical storage as a primary medium for image as well as for data processing, noted Akiba Keehn, Maimonides' MIS director.

The interface will not be used until the hospital finishes upgrading its current mainframe to a Unisys Corp. A 12E, a process that is expected to take another two years, Keehn pointed out. At that time, he added, the hospital also expects voice messaging for the radiology lab to become operational.

The new system is already proving its worth to the hospital's administration, Maimonides' Dipple declared.

"When an outside organization such as Medicaid or Medicare seeks information, it used to take a week to 10 days. It now takes a half a day," Dipple said.

"At first, I was skeptical of optical systems, particularly the networking part," Dipple recalled. "But this system is so soft, it takes about 20 minutes to train someone to learn how to use it."

Gibson

CONTINUED FROM PAGE 55

connect with."

But that is a weak response, probably too weak for DEC to be comfortable with in the long run. It is, in effect, putting a Band-Aid on DEC's Achilles' heel — the desk top.

All this evidence supports the belief that DEC will announce another desktop system, probably a desktop VAX, most likely at Decworld this fall. DEC watcher Terry Shannon, a technical consultant at VMS software house Computer Information Systems in Braintree, Mass., voices the opinion that the desktop machine has been nicknamed the "PVAX" and will use the Microvax 3000 CMOS processor. As a result, it will put 3 million instructions per second (MIPS) on the desk top in place of the 1 MIPS currently available with the Vaxstation 2000, he says.

DEC is pouring huge amounts of time and effort into expanding its large systems to compete more and more with IBM. In doing so, it is going head-to-head with an immovable object in a market that is not growing that fast. At the same time, DEC has virtually no presence in the fastest growing personal computer market. That does not sound like a formula for long-term success.

Without a growth strategy for desktop computing, Olsen, who has basked in the glow of favorable publicity for several years, could be headed for another period of bashing such as he endured during the Rainbow's fall from grace in 1983.

Gibson is *Computerworld's* senior editor, systems & peripherals.

Encore adds another Annex

MARLBORO, Mass. — Encore Computer Corp. recently announced the Annex II, a successor to its current line of Annex servers designed for Ethernet and Transmission Control Protocol/Internet Protocol-based networks. The server is intended for Encore's own systems as well as those of other vendors.

Originally designed as a front end to Encore's Unix-based parallel processing systems, the Annex server is well-suited to any Unix-based system, according to the vendor.

The Annex II is offered in a 16-port version that is capable of supporting up to 128 concurrent sessions and a 32-port version that is said to handle up to 256 concurrent sessions.

The Annex II features a larger memory space than its predecessor, which had 16 ports and could handle 64 concurrent sessions, according to an Encore spokesman.

The Annex II uses a National Semiconductor Corp. 32016 processor and an Intel Corp. 82586 Ethernet controller.

Priced at $8,500, the 32-port version offers a price per port of $265. The 16-port version is priced at $5,500.

The Annex II replaces the Annex server and is available immediately, Encore said.

What do we call an organization that insists on hard network comparisons and live evaluations before buying?

NEW PRODUCTS

Data storage

Intel Corp. has announced the availability of two user-installable memory modules that allow users of Intel ISBC 286/1X Multibus I processor boards to upgrade their system memory.

The **ISBC 322** memory module contains 2M bytes of zero-wait state dynamic random-access memory and allows an upgrade of an ISBC 286/12 board to an ISBC 286/14 board. The **ISBC 324** contains 4M bytes of dynamic RAM and can upgrade ISBC 286/12 and 286/14 boards to an ISBC 286/16.

The ISBC 322 costs $1,750, and the ISBC 324 costs $3,250.

Intel, P.O. Box 58065, Santa Clara, Calif. 95052. 800-548-4725.

Emulex Corp. has introduced the **UD23** disk controller for connecting enhanced small device interface disk drives to Digital Equipment Corp.'s Unibus.

The quad-size product implements DEC's mass storage control protocol to provide a software-transparent interface to the computer. The disk controller can then perform maintenance tasks, including bad block replacement, seek optimization, command ordering and data mapping. The product includes a 32K-byte buffer, data transfer rates up to 2M byte/sec. and block-mode direct memory access.

The UD23 costs $2,800.

Emulex, 3545 Harbor Blvd., Costa Mesa, Calif. 92626. 714-662-5600.

Terminals

Kimtron Corp. has introduced an option for its KT-70/PC terminals. The RS-232 serial port terminal now has an adapter providing parallel printer connection off the auxiliary port.

The KT-70/PC is self-detecting, depending on which printer type is selected, and requires no special hardware or software to use either serial or parallel printer ports. The product includes a built-in, on-line calculator mode, and the monochrome terminal is available in green, amber or paper-white.

The KT-70/PC costs $599. The option is priced at $50.

Kimton, Building 380, 1709 Junction Court, San Jose, Calif. 95112. 408-436-6550.

Link Plus, a subsidiary of Link Technologies, Inc., has announced the **MC 27**, an alphanumeric terminal designed for use with Unisys Corp. and former Burroughs Corp. mainframe computer systems.

In addition to Unisys T 27 and ET 1100 compatibility, the product can emulate a Digital Equipment Corp. VT220 to allow simultaneous connection between Unisys and DEC computer systems. Users can access each system through separate windows on the display screen. The product is suited for data entry, data inquiry and text processing applications. Displays are available in amber, green, or white.

The MC 27 costs $895.

Link Technologies, 47339 Warm Springs Blvd., Fremont, Calif. 94539. 415-651-8000.

Printers/Plotters

A wide-format laser plotter has been introduced by **Versatec, Inc.**

The **Versatec 8836** offers fast plotting speed, unattended operation and plain paper output and is targeted for architecture, mapping, mechanical and electrical computer-aided design markets.

Drawing with the laser xerographic process at 400 point/in. resolution, the product produces reports at a constant speed of 1 in./sec. Standard interfaces for the 8836 include RS-232C serial, Versatec parallel and Genicom Corp.'s Centronics parallel interface.

The Versatec 8836 laser plotter costs $28,000.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051. 800-538-6477.

Harris Corp.'s Data Communications Division has added bar-code capabilities as options for two printers in its Challenger series of IBM 3270 interactive communication products.

The **H224** is a tabletop device that supports up to 19 types of bar code and is plug-compatible with the IBM 4224, 3287 and 3286 printers.

The **H162** shuttle matrix line printer is a floor model and is directly compatible with the IBM 3262 device and is available in either 300 or 600 line/min. configurations.

The H224 is priced from $3,985 to $5,600. The H162 costs from $11,500 to $13,500.

Harris Data Communications Division, 16001 Dallas Pkwy., Dallas, Texas 75248. 214-386-2000.

Minolta Corp. and JRL Systems, Inc. have jointly developed the **340G Highres Laser System**. The product is said to provide a high-resolution, plug-compatible alternative to electrostatic plotters. It has 400 dot/in. resolution in either 8½- by 11-in. or 11- by 17-in. formats, prints up to 20 page/min and has 4M bytes of raster memory.

The 340G Highres Laser System costs $14,600 excluding options.

JRL Systems, 8311 Highway 71 W., Austin, Texas 78735. 512-288-0242.

We at N.E.T.™ positively love an in-depth comparison.

Because we win repeatedly. We win the comparative evaluation. We win a client.

Our next client.

You win when you demand proof positive that a network delivers on its promises of performance.

Network performance varies considerably. That's why it's vital you put your network candidates through the toughest drills in the industry.

Capacity Check. Verify the number of trunks and ports a node supports, and the capacity your overall network can handle, to be sure your network doesn't run out of gas during peak loads.

Reroute Race. Record how long it takes to switch a call through another route when a connection is broken, and even more important, how long it takes to reroute multiple calls (can the network handle multiple reroutings simultaneously?).

Manageability Acid Test. Give network management tools a workout to see how easy they are to use, and how much control they offer. Add a node site to the network to see how complicated and time consuming an addition will be.

Node Knockdown/Knockout. Pull different cards, shelves, and other components to see how nodes adjust to a *knockdown*. Pull the plug on a node to see how the network handles a node *knockout*. Plug back in to see if and when the node gets back up.

Pack the Net. Verify the amount of bandwidth a trunk provides and the entire network delivers for user traffic. Efficient bandwidth usage is key to rapid payback.

See what the vendor's network does for other companies.

After all, the *real* test is reality.

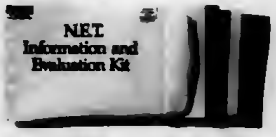
Our successful T1 and T3 network installations range from the most critical national security applications to six of the top nine diversified financial companies in America. Nearly 30 of the top 80 MIS/DP installations. Six out of the 17 largest commercial banks.

And more are becoming N.E.T. clients all the time.

How to begin your evaluation today:

Call today to find out about our free T1 *Evaluation Workshop*, where you can put a leading network through the toughest drills in the industry.

Or, simply ask for our free *N.E.T. Information and Evaluation Kit*.



Information Hotline: 1-800-952-6300 (in CA: 1-800-423-4440). Ask for dept. N42

Our clients are winning.™

NETWORK EQUIPMENT TECHNOLOGIES™

See us at ICA Booth #2334

N.E.T., Network Equipment Technologies and Our clients are winning are trademarks of Network Equipment Technologies, Inc.

WE WANT YOU TO FORGET EVERYTHING YOU KNOW ABOUT UFO.

Because unless you're among the 2000 current users of the industry's leading application development system, you don't know how much UFO has changed since we acquired the product 18 months ago.

And has it changed.

Take resource efficiency. Now with fully re-entrant, compiled code, UFO is the most resource-efficient product of its kind. A *Datapro* study* confirms it: *"UFO Productivity System has proven to utilize about 40% less storage and operates faster...than competing products."*

And now it's fully portable across CICS, CMS, TSO, VM—even the 9370. For even more flexibility, UFO now operates in MVS/XA and gives users efficient on-line access to their DB2 and SQL data bases.

Product support? We've done everything from writing completely new documentation, to speeding our response time to user requests for assistance by a full 66%, to sponsoring enthusiastically attended UFO User Groups across the country.

All of which is tangible proof we're devoting considerable resources to UFO. Which isn't surprising.

Business Week recently named us among the top 15 U.S. companies in percentage of sales poured back into research and development.

So when you're looking for an application development system, we have one further request. Remember to look at UFO.

For a *Free UFO Intro Diskette*, or to arrange a *30-Day Trial*, call toll-free 800-642-0177. In Canada, call 416-671-2272. In Europe, call 44-1-631-3696.

On-Line Software
INTERNATIONAL
Authorities in IBM Software

UFO Productivity System. The Application Development System Worth Remembering.

* 1987 Datapro 70 Report. IBM is a registered trademark of International Business Machines.

The schooling of MIS: Are you meeting the need?

BY GLENN RIFKIN

Michael Hammer, a popular MIS management consultant, plays to his audience — 70 MIS professionals from a large bank in Buffalo, N.Y., — like a comedian handling a Saturday night crowd in the Catskills. He displays a graphic on an overhead projector of what he calls the traditional DP shop: stick figures representing MIS and, beyond a high stone wall, the end users. "You remember," he yells, pointing to the figures inside the wall. "This was US! And that was THEM!"

Amid the laughter, there is serious business. The bank has invested $1,500 per person for this seminar and has flown MIS people from other regions in to Buffalo to attend. The bank expects this three-day seminar run by Cambridge, Mass.-based Index Group, Inc. to deliver what its MIS executives increasingly need: continuing education.

"MIS education has never been as critical as it is today," says Jack Ahlin, director of management development for information and telecommunications systems at IBM.

David Kearns, chairman of Xerox Corp., adds, "Education is a bigger factor in productivity growth than increased capital, economies of scale or better allocation of resources. Information and knowledge are the foundation of our economy."

Such lofty statements may reflect the importance of education, but, unfortunately, they do not mirror corporate reality. Continuing MIS education is a well-financed priority in large, cash-laden corporations (see story page 65), but for the majority of MIS departments, education is more a luxury than a necessity.

And in the midst of economic uncertainty, the first casualty of belt-tightening is often education and training. Thus, the largest Fortune 500 companies with the largest caldrons tend to enjoy the benefits of MIS education. "It's a case of 'the rich get richer,' " one educator says.

"The leading companies are willing to spend the money. Others are not," adds Ephraim McLean, professor of information systems at Georgia State University in Atlanta. "The top 2% of the corporate world is enlightened; the rest of the world is far behind."

The key words for most shops are time and money: There isn't enough of either to make serious commitments to education and training. The Riggs National Bank of Washington, D.C., for example, budgeted $40,000 for the training of its 134-person MIS staff this year, down from $60,000 in 1987.

According to Jerry Cavanaugh, Riggs' vice-president of MIS operations and technical support, the money allotted is keyed to the economic climate. "There'a been a general effort to contain costs," he says.

"We're not a leading-edge environment," says James Taylor, senior vice-president and director of DP for United Missouri Bank of Kansas City NA. "We're lucky if we get one or two days [of training] per year. There's not enough time, and it is a source of frustration."

According to Applied Learning International (formerly Deltak), a video courseware provider in Napier, Ill., the average MIS shop spends just 2.5% of its budget on training and education. And as Cavanaugh points out, when there is training, it tends to focus on getting a particular person up to date on a specific product rather than on broadening his career.

Yet here is where the rich get richer. A commitment to education draws the best and the brightest in any field, particularly in information systems.

Young MIS professionals understand the importance of adding business skills to their technical strengths. And MIS managers know how critical it is for staff to stay technically up to date — if not at the leading edge.

Once out of school, an MIS professional depends on his employer or his own pocketbook to further his education. Big corporations with deep pockets not only provide sabbaticals but often pay tuition as well.

But most MIS professionals can expect far less in the way of educational opportunities. And if the employer does not provide continuing education, it is unlikely employees will pursue it on their own.

A recent study by the American Society for Training and Development in Alexandria, Va.,

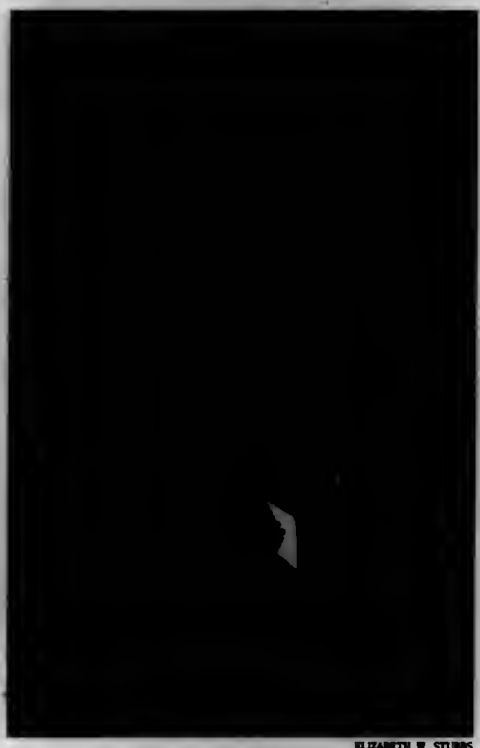
Rifkin is a senior editor at *Computerworld*.

INSIDE

IBM spares no expense for training
Page 65

MIS pros must drive own development
Page 66

Sampling of MIS education flavors
Page 69



ELIZABETH W. STUBBS

IN THE RACE FOR PRODUCTIO

NO SYSTEM CAN BUI PROCESS TRANSACTIONS

DRIVE YOUR VAX TO THE MAX WITH CULLINET'S NEW GENERATION VAX TECHNOLOGY.

Now there's a new breed of production powered solutions for VAX™ systems. IDMS/SQL™ and KnowledgeBUILD™ – a set of fully relational database management and application development tools so technologically sophisticated that they literally blow the competition right off the track.

ONLY CULLINET HAS THE ENGINE AND THE TOOLS TO MAXIMIZE VAX PERFORMANCE.

The winning engine is IDMS/SQL – a true production-power SQL-compatible relational database management system developed to take maximum advantage of Digital Equipment Corporation's family of VAX computer systems. IDMS/SQL combines the latest advances in database technology with a flexible, modular architecture that's particularly well-suited to continuous operation, high transaction throughput and distributed processing across multiple machines. It also includes referential integrity and multi-level security – key requirements for today's production systems.

KnowledgeBUILD puts Cullinet ahead of the pack. This easy-to-use set of tools combines forms and report painters with non-procedural specifications to accelerate application development. The result is the automatic generation of high performance COBOL or FORTRAN applications that work with either IDMS/SQL or VAX RMS™ files. And KnowledgeBUILD's simple but powerful reporting tools give end-users easy access to information.

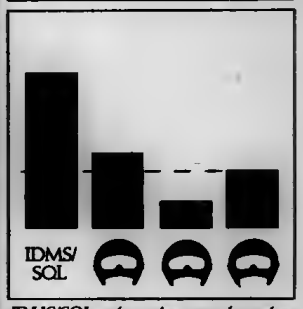
For embedding expert components in business applications or developing discrete expert applications, nothing surpasses Application Expert.™ By extending KnowledgeBUILD's advanced development environment, Application Expert enables users and MIS professionals to capture and maintain knowledge in the form of rules. It gets the checkered flag for ease-of-implementation.

IDMS/SQL, KnowledgeBUILD and Application Expert are trademarks, and the Cullinet logo is a registered trademark of Cullinet Software, Inc. VAX, VMS and RMS are

ON-POWERED VAX SOLUTIONS...

LD APPLICATIONS OR
S FASTER THAN IDMS/SQL.

TP1 BENCHMARK SCORECARD



IDMS/SQL performs three times faster than the competition based on a tp1 benchmark (tp1 is an industry standard metric of on-line transaction processing for retrieval and update in a multi-user environment).

WATCH US LEAVE THE COMPETITION IN THE DUST AT AN IDMS/SQL SEMINAR NEAR YOU.

The most compelling way to demonstrate the power of our VAX-software is to take a "test drive" at one of Cullinet's IDMS/SQL Seminars. And that's the easiest way for you to learn about the most advanced software ever developed to run production applications on VAX systems. Call 1-800-551-4555 for more information or mail in the attached business reply card or write to Marketing Services, Cullinet Software, Inc. 400 Blue Hill Drive, Westwood, MA 02090-2198.

Cullinet®

An Information Technology Integrator For The 80s, 90s And Beyond.

trademarks of Digital Equipment Corporation. IBM is a registered trademark of International Business Machines Corporation. Copyright © 1988 Cullinet Software, Inc.

Schooling

FROM PAGE 61

reveals the following:

- Most skills acquired after the age of 25 and all skills for two out of three jobs are acquired in the workplace.
- Workplace learning accounts for an 85% variation in lifetime earnings, compared with only 15% for formal education.
- By the year 2000, 75% of all workers currently employed will need retraining.

The heat is on

Whatever the commitment to education, the need for it is clear. Jim Wetherbe recently spoke to 280 MIS professionals at a seminar held at the Management Information Systems Research Center at the University of Minnesota's graduate school of business, where he is director.

"How many of you feel overwhelmed by increasing developments in the field that you know less and less about?" Wetherbe asked the group. Every hand went up in response.

According to Wetherbe, the dearth of understanding about fourth-generation languages, data base packages, personal computers and PC software in the early 1980s cost MIS a great deal of credibility within the corporation.

"Users knew the tools better than MIS," Wetherbe says. "My sense is that MIS is trying to stay on top of things better now, but it is difficult. The average information systems person should allocate 25% of his work time to staying current; otherwise, he will be using an intellectual hoe."

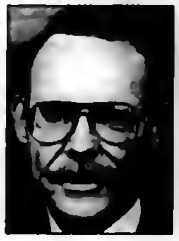
Unfortunately, time is not an abundant commodity within MIS. Educators agree that getting an MIS professional, particularly a senior-level person, away from work and into a classroom for more than a few hours is difficult, if not impossible. Firms offering educational courses for MIS often insist on off-site locations because this is the only way to guarantee participation.

"You do well to hold them for one day," says Dottie Scates, training manager for information management at GTE Data Services, a leading DP supplier in Tampa, Fla.

"Trying to do anything in-house never works," adds Catherine Ditamore, manager of technical services at ARA Services, Inc. in Philadelphia. "The senior people are always getting pulled back to their offices for something; their secretaries will come after them, or they'll get on the phone at the break, and you won't see them again."

The irony is that while most professionals cannot afford spending more than two days at a course, two-day courses provide little more than a detailed overview. Complex technical topics and management issues require weeks and sometimes months to fully grasp.

Large corporations might be willing to send senior people to several weeks of courses at schools like Harvard University, the University of California at Los Angeles (UCLA) or Stanford University during the summer, but such training is expensive. A three-day summer session at MIT — offered by the Center for Information Systems Research at the Sloan School of Management — costs more than $2,000 per student.



"THE TOP 2% of the corporate world is enlightened; the rest of the world is far behind."

EPHRAIM MCLEAN
GEORGIA STATE UNIVERSITY

When he taught MIS at UCLA in 1978, Georgia State's McLean developed a week-long summer course for MIS executives. By the second year, the course filled up with 60 executives; it has been offered to a capacity audience ever since. But even McLean admits that the $2,150 fee for the week is "pretty steep."

And it is difficult to draw new companies. The same firms tend to send people each year, McLean says. "Most companies are not in a position to worry about tomorrow," he says. "The successful ones recognize that people are their most important asset and are willing and able to spend the money on them. The others fall farther behind."

MIS education generally divides into two categories: technical training and business and management education. A professional schooled in both environments is a rare gem for MIS shops. More and more graduate schools of business are preparing students with a profile fitting these two requirements, and programs in computer science are recognizing the need for better business and communications skills in its graduates.

Unfortunately, such awareness now does not help those already in the MIS profession — specifically technicians with virtually no exposure to management training.

Taming the wolves

Many longtime DP employees have no interest in taking business courses. They tend to perpetuate the "lone wolf" image of programmers whose lack of interpersonal skills keeps them, quite contentedly, where they are in the organization.

"I'm not hearing a clamoring for help," one MIS manager at a national service organization says. "Some people, frankly, aren't smart enough or aware enough to ask for help. They just don't have the ambition to do more. And there will always be a place for them in big corporate [worlds] doing standard Cobol."

"We have to remind ourselves not to get carried away

DL/I SPACE, DO YOU CONTROL IT OR DOES IT CONTROL YOU?

When was the last time your users told you ahead of time that they would be adding tons of records to your DL/I data base? Do you like the kind of surprises that this brings?:

- Online application abend: U844.
- Application unavailable.
- Telephone calls from irate users.

With the number of data bases that you currently monitor, you just don't have time each day to see which data bases are running short on space. Either you ignore the non-critical data bases, or you just check space periodically.

Data Base Control looks at all data bases, every day. It knows how much each grew since yesterday or since last week, and warns you if an unplanned activity starts to use up all the available freespace...before it takes you down.

DBC is an integrated set of tools for the DL/I data base administrator that manages MVS and DL/I space, analyzes data base performance, and monitors batch applications.

So take control of your space, call: 1-800-533-9103 or 201-569-7335 (NJ) and ask for a free 30 day, no obligation trial.

DBC. WE GIVE YOU MORE CONTROL.

SCHUMANN CONSULTING GROUP
333 Sylvan Avenue, Englewood Cliffs, N.J. 07632

Running out of time to shop for ...

- Used Equipment
- Software
- Rental & Leasing
- Supplies
- Financial/Business Services
- Hardware
- Communications Equipment
- Time & Services
- Bids & Proposals
- Training Services
- Real Estate

... Find what you're looking for in MARKETPLACE and save valuable time!

COMPUTERWORLD
MARKETPLACE

Shop for the products and services you need. Every week.

TEST DRIVE IDMS/SQL™ AND KNOWLEDG
AT A FREE CULLINET SEMINAR NEAR

IDMS/SQL™: the
advanced databas
ever developed fo
systems. And Kn
BUILD™: the mo
prehensive tool se
available. In just a
hours, we can sho
how these product
powered solutions
your VAX system
high gear. There w
only one seminar
IDMS/SQL and
BUILD in your ar
year. So don't mis

CALL 1-800-5

Cullin

An Information Techn
For The 80s, 90s, A

E BUILD™
YOU.

e most
e software
- VAX ™
owledge-
st com-
t
few
w you
tion-
can shift
s into
vill be
on
Knowledge-
ea this
s out.

551-4555

et

ology Integrator
nd Beyond.

I WANT TO LEARN HOW TO DRIVE MY VAX TO THE MAX AT A FREE CULLINET IDMS/SQL SEMINAR!

Please register me and a colleague for the Cullinet IDMS/SQL Seminar I've checked below. I understand Cullinet will contact me confirming my registration.

___CALGARY, CN	June 7th	___PHILADELPHIA, PA	May 24th
___CHICAGO, IL	May 24th	___ROCHESTER, NY	May 19th
___CINCINNATI, OH	June 8th		
___CLEVELAND, OH	May 19th		
___COLUMBUS, OH	June 14th		
___DENVER, CO	June 9th		
___DETROIT, MI	June 7th		
___HOUSTON, TX	June 9th		
___NASHVILLE, TN	June 8th		
___NEW YORK, NY	June 9th		
___OTTAWA, CN	June 9th		

Call 1-800-551-4555 for more information

NAME_____

TITLE_____

COMPANY_____

STREET_____

CITY/STATE/ZIP CODE_____

TELEPHONE (___)_____EXT.____

CW 5/16

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 423 NORWOOD, MA 02062

POSTAGE WILL BE PAID BY ADDRESSEE

Cullinet Software, Inc.
Attn: Marketing Services
400 Blue Hill Drive
Westwood, MA 02090-9990

TAKE
A
TEST
DRIVE
ON
US.

with having everyone knowing the business and lose our technical edge," adds Belford Cross, corporate manager of information systems at Digital Equipment Corp.

Nonetheless, the demand on MIS to perform more than a backroom function for the corporation requires a new kind of thinking for most in the field.

"The role of MIS is changing, and people can't think about automating the business the way it has been," says Walter Popper, director of the Index Institute, an educational arm of the Index Group. "They must create new ways of doing business to gain advantage over the competition."

Unfortunately, most companies — if they offer anything at all — provide broad management courses to the whole organization, and these courses rarely delve into specific MIS issues.

Establishing a structure

Some professional groups recognize the need for education and are instituting programs and courses for members. The Data Processing Managers Association (DPMA), for example, realized that the plethora of one-, two- and three-day courses available throughout the country provided a patchwork quilt rather than a cohesive, structured educational opportunity.

In late 1986, the DPMA unveiled a curriculum model intended to put structure into professional development and at the same time offer specific credentials to those completing the training. Both DPMA- and non-DPMA-sponsored courses can apply to this certification.

John Cargill, coordinator of

Continued on page 67

IBM goes to the head of the class

IBM is often a tough act to follow, but when it comes to MIS education, the industry leader is certainly a model worth considering.

Always noted for its commitment to education, IBM has paid particular attention to educating its systems people. This year, the Armonk, N.Y.-based corporation will spend nearly $75 million on educational offerings for its 16,000 MIS professionals around the world, according to Jack Ahlin, director of management development for information and telecommunications systems at IBM.

Even factoring in cutbacks brought about by IBM's financial slowdown in the past two years, Ahlin says the company supported 50,000 student days for MIS education last year, an average of 1,000 students per week. That will increase to 1,200 per week this year, the same level as in 1986 before the industry slump set in.

"Are we spending enough?" Ahlin asks. "The answer is no. We should be doing more to get our people up to speed. MIS education has never been as critical as it is today."

Most MIS organizations, able to provide only minimal educational opportunities, would blanch at the idea that $75 million is not enough. But Ahlin is seeking ways to provide more courses for less money.

IBM's formal education programs, he says, come in a variety of flavors. For technical education, the company relies principally on its MIS educational facility in Dallas. This 12-year-old center has 60 full-time faculty members and offers courses in virtually all technologies.

The courses cover a wide spectrum, from computer operations, office systems, networking, debugging and applications to proprietary IBM architectural activities such as Systems Network Architecture and Systems Application Architecture.

Beyond central classroom instruction in Dallas, the center sends instructors out to remote sites for courses, and IBM's own corporate satellite network provides educational television for IBM facilities around the world.

HAL MAYFORTH

"By the end of this year, 60% of all education will be provided over satellites," Ahlin says. "Studies show that the quality of this education is high. Plus, it is available at 40% of the cost of classroom training, and it cuts travel expenses significantly."

IBM also offers extensive management education at its Westchester County educational facility in Rye Brook, N.Y. According to Ahlin, a recent IBM study of MIS needs for the 1990s concluded that MIS people need in-depth general management skills, and IBM is offering courses to address that need.

For example, it offers a one-week course on information systems business directions. In the first two days, Ahlin says, MIS is never mentioned; the discussion centers on the business directions of IBM. By the third day, the course turns to the question of MIS strategy and its ability to aid the corporate strategy. "Our key managers get a fairly good dose of where MIS fits in to the corporation," Ahlin says.

In addition, MIS executives now have a version of IBM's President's Seminar, a week-long course for the company's top executives. In the MIS edition, the discussion covers global MIS issues and their impact on IBM and the company's business.

For the MIS rank and file at IBM, a steady stream of MIS courses are available, and Ahlin estimates that 98% of worldwide MIS takes part in one course or another each year. In fact, new MIS employees at IBM face five to 15 weeks of classes when first hired, depending on their educational backgrounds, and can then expect five to eight days per year of courses thereafter.

GLENN RIFKIN

General Course Appraisal	Not at all worthwhile	Not very worthwhile	Worthwhile	Very worthwhile	Extremely worthwhile	% of students rating course worthwhile to extremely worthwhile
How would you rate the course overall?	.05%	.87%	28.64%	48.13%	22.31%	99.08%

Comments on the Course Instructor	Poor	Fair	Good	Very Good	Excellent	% of students rating instructors good to excellent
Knowledge of subject matter	.02%	.78%	8.94%	38.32%	51.94%	99.20%
Clarity of interpretation	.16%	1.30%	12.13%	40.86%	45.55%	98.54%
Attitude towards students	0.00%	.47%	7.53%	32.84%	59.16%	99.53%
Willingness to give individual help	.02%	.29%	7.02%	31.13%	61.54%	99.69%

IBM

Questions? Problems? Change of Address?

To give you the best available service, we've staffed a toll-free number to answer your questions and deal with any problems you may be experiencing with your subscription. If you are moving to a new address, or changing jobs, call this number to speed up the change in our subscriber files and avoid missing a single issue

If you prefer, you may write to us. Attach your mailing label, and address your correspondence to: *Computerworld*, Customer Service Dept., P.O. Box 1565, Neptune, NJ 07754.

*(In New Jersey call 1-800-322-6286)

Feeding the professional mind

BY STEWART STOKES

Professional development is a random process for most senior MIS people. There is still a significant need for a disciplined approach to the matter — especially in light of today's shrinking MIS departmental structures, expanding end-user computing and radically changing corporate cultures.

And while MIS might expect more professional development activities to be institutionalized, supported by training personnel and driven by corporate commitment — as is the case with professional development programs for other senior-level executives — this is often not the case. Today, many MIS professionals are motivated to seek out their own educational avenues.

Wolly Morin, vice-president of information systems at Allied Stores Corp. in Auburndale, Mass., is aggressive about his own professional development and is every bit as concerned about the personal growth and development of those who work for him.

"The only reason I'm at this level in general information systems management is because I pushed harder and harder," Morin says. "You need to be aggressive so as not to become [pigeonholed]." If systems professionals concentrate only on short-run learning requirements, they will plateau early in their careers; there is too much going on, Morin says.

"Will yesterday's skills help you deal successfully with tomorrow's requirements? Certainly not," Morin points out. "If systems professionals concentrate only on things of importance today, they will lose tomorrow."

Among his self-imposed educational efforts, Morin reads publications from other industries. "I try to find ideas that I can transport across industry lines and bring to Allied from, say, the grocery industry or even from banking. We in information systems need to take ideas from other industries and ask, 'Will these [ideas] work here?' " Morin says.

Professional volunteer

Jim Slusser, corporate director of MIS at the Shipley Co. in Newton, Mass., says the most important part of his continuing education is relating systems to the company's business. He takes the extra step to learn all he can.

"I volunteer for all kinds of non-MIS projects and commit time and energy to them," Slusser says. "This helps give me the visibility I need to function effectively with senior line managers."

For senior MIS managers who seek them out, professional society activities are a significant strategy for networking and personal growth. For Paul Palmisciano, director of advanced systems and planning at Codex Corp. in Canton, Mass., the Boston chapter of the Society for Information Management (SIM) is a prime vehicle for his professional development and networking.

Slusser and Morin take advantage of SIM opportunities, as well. Morin is also active in the National Retail Merchants Association, often attending — and conducting — seminars.

Unfortunately, these MIS professionals are exceptions. Too few systems people are active in professional associations, and this lack of involvement can hinder professional growth. The excuse "I have no time" may cut off these professionals from possible career challenges and potential advancement.

> "IF SYSTEMS professionals concentrate only on things of importance today, they will lose tomorrow."
>
> WOLLY MORIN
> ALLIED STORES CORP.

One of the problems with MIS education today is that it lacks a frame of reference for professional development.

True, there are university management development programs, and a few senior MIS executives are nominated to attend. But managers need to learn how to learn, and our human resources professionals are not doing all that well helping them.

There appear to be two reasons for this situation: First, organizations tend to view training and education as lower level activities with a short-run focus, and human resource personnel are expected to abide by that perspective.

Second, because of this focus, human resource departments often have difficulty communicating with upper level managers and are out of the loop when it comes to influencing professional development.

Get the company to help

Organizations need to see themselves as resources for learning, and senior executives in all functional areas — MIS included — need to be open and explicit about creating innovative and challenging learning environments.

Corporations are among the prime economic and social organizations of the 20th century, and they are rich resources for learning; indeed, learning is a prerequisite for survival — for organizations as well as people. Companies need to become more outspoken in their support of professional development.

Finally, systems professionals on all levels — senior executives especially — need to think in more creative terms when it comes to professional development. "We don't like to accept the fact that experiences outside MIS can be valid inside as well. We like to believe we're different," Morin says.

Senior systems people are working in extremely complex and stressful surroundings and could benefit from educational opportunities that would expose them to people and ideas from other fields.

Such programs would enrich their understanding of the dynamics that influence their organizations and would also encourage them to think creatively as they help to solve business problems. •

Stokes is vice-president of QED Information Sciences, Inc., an education and training provider based in Wellesley, Mass.

Promote world change.

We want people who can promote something much grander than products: vision. The vision of a world where the power to be your best is within everyone's reach. That vision extends to the education market where we're developing exciting software for the next generation of Apple users.

Today, that vision is shared by over three million people throughout the world. So we only have a few billion more to go. Help us reach them by applying now for one of these opportunities:

Evangelists

As the link between Apple and education market software developers, you'll establish and nurture developer relationships resulting in superior third-party Apple products. You'll maintain close contact with developers, consulting with them on product design issues, championing their needs, and recruiting new, potential developers for Apple. Both positions require a Bachelor's degree, or equivalent. Experience in educational software development and educational sales and marketing are also necessary.

K-12 Education Market Evangelist

You'll be instrumental in the production of superior third-party Apple II, IIGS and Macintosh™ products. Requires an understanding of both Apple II and Macintosh technology and networking applications, as well as curriculum for the K-12 education market.

Higher Education Market Evangelist

You'll be instrumental in the production of superior Macintosh products. Requires an understanding of Macintosh technology as well as software use and applications for the higher education market.

To apply, send your resume to: APPLE COMPUTER, INC., Human Resources, Dept. PM7CW, 20525 Mariani Avenue, MS27-AS, Cupertino, CA 95014. Principals only; no phone calls, please. An equal opportunity employer.

The power to be your best.™

©1988 Apple Computer Inc. Apple and the Apple logo are registered trademarks of Apple Computer Inc.
Macintosh is a trademark licensed to Apple Computer Inc.

Looking for used equipment?

Get *used* to finding what you want — and saving time — with MARKETPLACE.

COMPUTERWORLD MARKETPLACE

Shop for the products and services you need. Every week.

Schooling

FROM PAGE 65

Management in Computer Information Systems Curriculum at the DPMA, points out that the program is intended to be flexible enough for MIS professionals to gain benefit at any point in their careers.

"People in upper level management will obviously focus more on management skills as an asset to the corporation," he says. "Those in mid-career are trying to develop an expertise in a niche, but they also need to gear up on management issues, such as financial planning and return on investment. Those just entering the field focus more on technical issues, but they need to have a sense of where high technology is going as an industry as well as how to become effective managers."

Human resource help

A priority on education tends to flourish in companies with strong human resource functions. The emphasis on individual development is corporatewide and filters into MIS. But this has not always been the case, ARA's Ditamore says. Human resource professionals have, until now, known little about information systems, often leaving personal development issues to MIS itself, which, in turn, let these concerns slip through the cracks. "This should be a human resources function," Ditamore says. "We need to find people in human resources with a minor in computer science."

DEC's Cross

Companies like DEC, IBM and GTE, all with strong human resources cultures, invest heavily in educating and training MIS. DEC, with 6,000 MIS employees worldwide, provides a wide range of educational opportunities for its people.

Getting technical people to absorb interpersonal and communications skills is no longer just a nicety, according to Cross. MIS and its relationship to the rest of the corporation has changed dramatically in the past five years, he says.

"We measured how much computing capacity is in the end-user area and the data center," he says. "For every 100 MIPS in the data center, there are 1,000 MIPS out with the users. Three years ago, that figure was 1-to-1, and five years ago, there were less MIPS outside than inside the data center."

In order to keep MIS educated, DEC has formalized a number of programs. It offers a two-year internship program for 25 handpicked information systems hires. Each intern is moved to a new discipline every six months until he gets a solid grounding in all functions within MIS, including networking, programming, telecommunications and operations.

The company also offers programs in systems management, project management, languages and software development for internal MIS.

According to Cross, the average MIS professional receives a minimum of two weeks' training per year, and someone changing roles within the organization gets double that amount.

The key technical questions that DEC faces are the same that challenge most MIS shops, Cross points out. The hot topics today are data base technology, optical storage, fourth-generation languages, computer-aided software engineering tools and new applications. But the question is, Cross says, "Is it hot and critical or just hot and fun?"

Most important is connectivity, specifically from a business perspective. "As we achieve connectivity, how do we take advantage of it? What does integration really do for you? Who should be connected to whom? These are management questions, because they change organizational design and work flow," Cross says.

DEC sends people outside for education as well. Cross has sponsored MIS people for Stanford and Harvard courses

Continued on page 69

What do you need?

What kind of career assistance should you look for? The following questions can help formulate educational and professional development needs.

- How has your organization's MIS activity changed in the past three years?
- In what ways is your job changing?
- What is or will be the most important knowledge requirement for success in MIS — or in MIS management?
- What is or will be the most important skill for success in MIS or MIS management in your organization?
- What important trends do you see developing that will affect MIS, your organization and your career?
- What sources of professional development will help you meet the above challenges and further your career?

STEWART STOKES

Why We're Betting a Million Lines of Code on the SAS/C™ Compiler.

At SAS Institute Inc., we've invested more than 10 years of research—and over a million lines of code—in the SAS® System, the world's leading data analysis software. So you can bet we left nothing to chance when we chose the C language for the next generation of our software.

We selected C for the portability it would bring to the SAS System, but weren't about to risk our code on just any mainframe C compiler. So we tried them all. When none could meet our exacting requirements, we created our own: the SAS/C compiler.

We Developed It. Support It. Use It.

The SAS/C compiler set new standards for efficiency and technical quality, with:

- A source-level debugger that includes structure display, ABEND recovery, and debugger I/O exits for debugging specialized applications
- Reentrant object code
- Highly optimized generated code
- Use of standard IBM linkage conventions, with support for 31-bit addressing
- A CMS Rexx/TSO CLIST interface
- Support for signal handling including program checks and terminal interrupts, and non-standard signals such as timer interrupts and stack overflow
- Many built-in functions including string handling
- In-line assembler.

SAS is a registered trademark of SAS Institute Inc., Cary, NC, USA. SAS/C is a trademark of SAS Institute.

Copyright © 1987 by SAS Institute Inc.
Printed in the U.S.A.

And when we combined these features with outstanding technical support and frequent updates—both provided free—software developers everywhere took notice. The SAS/C compiler is now the market leader, installed in hundreds of commercial firms and academic institutions.

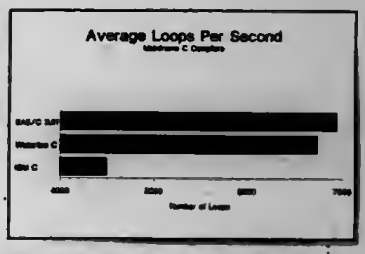
Test It. Compare It. FREE for 30 Days.

We're betting you've set the same high standards. That's why we'd like to send you the SAS/C compiler, under OS or CMS, for a free 30-day evaluation. We'll also send you a free copy of a leading benchmark program. Compare our compiler with any other. Odds are, you'll choose the SAS/C compiler.

Just mail the coupon below. Or call your Software Sales Representative at (919) 467-8000.

SAS Institute Inc.
SAS Circle ☐ Box 8000
Cary, NC 27512-8000
Phone (919) 467-8000
Fax (919) 469-3737

Using a C version of the Dhrystone benchmark, the latest SAS/C compiler release produces the fastest code among the top 3 mainframe compilers. It even tops our own previous release by 35%.



I'd like to put the SAS/C™ compiler to the test with a free 30-day trial, and my free copy of the Dhrystone benchmark program. Give me the details.

Please complete, or attach your business card.

Name _____ Title _____
Company _____
Address _____
City _____ State _____ ZIP _____
Telephone _____ CW18MAY88

Mail to: SAS Institute Inc., Attn: CC, SAS Circle, Box 8000, Cary, NC, USA, 27512-8000

Let us change the way you talk to the world.

MCI® gets you through to more people, in more places, in more ways than anyone else. Through worldwide direct dial, fax, telex, electronic mail or global digital private lines.

For example, you can store and forward telexes and even send them to or from PC's.

Or "mail" virtually any information electronically—spreadsheets, binary files, letters, graphics. With software links that send them instantly. And hard copy delivery options that go literally everywhere.

We'll enable you to talk to the world from just about any office automation system or PC. Including the one you already own.

You can create your own global private network, too, with private lines to Canada, the U.K., Europe, the Pacific and Latin America.

And everywhere you can dial direct, you can dial direct with MCI, with up to 22% savings vs. AT&T.

Our messaging experts are ready to help you put together the most efficient, cost-effective communications in the world. And, to keep them that way.

Until you call, you'll never know how much better a long distance company can be.℠
1-800-888-0800.

MCI

Let us show you.

© MCI Communications Corporation, 1988.

A time and a place to learn

A mix of professional societies and private organizations offer MIS courses and seminars. The following is a sampling:

✔ Technology Transfer Institute, Santa Monica, Calif., 213-394-8305. Sample course: "Experts on Networks," four days, $1,095 per person. Designed for technical managers, data communications planners, information resource managers and managers of local and global data networks.

✔ Index Group, Inc., Cambridge, Mass., 617-492-1500. Sample course: "Systems Leadership," three days, $1,500 per person. Designed for upper level MIS and business managers.

✔ American Management Association, Saranac Lake, N.Y., 518-891-0065. Sample course: "Long-Range Information Systems Planning," three days, $825 per person for members, $950 per person for nonmembers. Designed for directors of DP, MIS or information systems departments, as well as for managers of systems, managers of operations and directors of corporate planning.

✔ QED Information Sciences, Inc., Wellesley, Mass., 800-343-4848 (617-237-5656 in Mass.). Sample course: "Managing Change in Systems and User Environments," three days, $850 per person. Designed for high-level information systems professionals, including project leaders, project managers and DP directors.

✔ Applied Learning International (formerly Deltak), Naperville, Ill., 800-323-0377 (800-346-6079 in Ill.). Sample course (video-based): "Strategic Information and Mission Critical Systems: Creating a Competitive Edge," 2½ hours, price withheld. Designed for information systems managers and executives, chief information officers, end-user managers and executives and corporate planners.

✔ Society for Information Management, Chicago, 312-644-6610. Sample course: "Breaking Out of the Mold: Challenging the Norm in Creating Solutions for Today's Economic Business Environment," three days, fees range from $250 to $1,000 per person; members and nonmembers invited. Designed for senior-level MIS managers and executives.

Schooling

FROM PAGE 67

as well as 20 other seminars. "Education is critical for keeping a technical edge," Cross says.

GTE Data Services has set up internal education programs aimed at serving its seven data centers throughout the U.S. and offers these services to outside organizations as a profit-making venture. Donald Peeples, president of GTE Data Services, says, "Anyone who has not been to a course in the last two years is growing obsolete."

This emphasis on both technical and managerial training is intended to bring in a "multiple-fold increase in productivity," GTE's Scates says. The company's DP professionals average about two days of training per month, both internally and from outside vendor offerings. "We don't even attempt to meet the need ourselves," Scates says. "It can't be done."

Getting something out of it

Scates admits that two-day courses on complex issues are not sufficient. "But adults will learn if they have a need to know," she says.

Scates points out that employees are provided with manuals and other materials from courses, and outside customers receive a hot line number that they can use to call for help. Internal students can follow up at the company's information centers. Scates' staff also does internal consulting to tailor training to specific needs of individual business units.

Jean Moore, who heads GTE's management development programs, adds that the most effective courses are not stand-alone offerings but companywide projects that encompass directors, managers, supervisors and the rest of the staff all working toward the same end.

"People in this industry are overwhelmed today because things are changing so rapidly," Moore says. "The ideal person is someone who can deal with that ambiguity, and you can't teach that in one- or two-day classes. You need a concerted company effort, functional areas working toward one goal, and you need role models for people, a profile that is rewarded for this kind of skill. You need to

UNIX SYSTEM • 'C' • PC

VIDEO-BASED TRAINING

UNIX System Courses
UNIX System Executive Perspective
UNIX System Overview
UNIX System Fundamentals
vi Editor
Unix System Shell
UNIX System V Internals

'C' Language Courses
'C' Language Programming
Advanced 'C' Programming

PC Courses
PC Primer
Running MS-DOS
DOS for the Power User
Lotus 1-2-3
dBASE III Plus
Multimate
Word Perfect
Multiplan
Enable
Displaywrite
and many more

Free demonstration packages available. Please call the number below.

SEMINARS

UNIX System and 'C' Language Public Seminar offerings include *UNIX SystemOverview, UNIX System Fundamentals for Non-Programmers, UNIX System Fundamentals for Programmers, Shell as a Command Language, Shell Programming, Advanced UNIX System Commands, UNIX System Administration, UNIX System Internals, 'C' Language Programming, Advanced 'C' Programming Workshop, Advanced 'C' Programming under UNIX.* On-site seminars and custom-tailored seminars are also available.

UNIX System public seminars will be presented in seven cities throughout 1988: Washington, Chicago, Los Angeles, Boston, San Francisco, New York, and Dallas. For your 1988 schedule, please call us.

SOFTWARE

386/ix Product Family, which includes:
UNIX System V .3 Run-time
VP/ix, multi-user DOS under UNIX
TEN/PLUS User Interface
Software Development System
Text Processing Workbench

MKS Toolkit, which provides: UNIX-like tools for DOS systems

Reseller programs are available for both video-based training and software.

To order, or for your free product catalog, call:

(800) 323-8649 or
(312) 987-4084

COMPUTER TECHNOLOGY GROUP
Telemedia
310 S. Michigan Ave. Chicago, IL 60604

*UNIX is a registered trademark of AT&T

find them and nurture them."

The Index Institute's Popper also suggests rotating high-potential MIS people into other positions — moving a programmer to work with end users, for example — so they understand the total business function. High-potential systems people can also be paired with senior sales people to expose them to a side of the business they would otherwise never see. "You should invest heavily in the top 20%, the people who see the future," Popper says.

Moore advises that education cannot be forced. GTE avoids using the word "mandatory." "We soft-pedal it and issue gentle reminders, keeping records of how many courses people have taken," he says.

Scates is aware that some "old-timers" in DP are wary of new technology, but resistance, she says, is tantamount to obsolescence. "Those who have survived have a learning mentality. People who don't have that mentality aren't there anymore. It's very competitive and getting worse."

Added to the burden is finding people who can teach the courses; instructors must stay one step ahead of the people they are teaching. "We're constantly challenged to provide leading-edge information," Scates says. "Our frustration is keeping our materials current. Things change all the time. We spend 15% of our time just staying ahead.

"Finding teachers is extremely difficult. I need practical experience in my instructors," she adds. "I won't hire anyone without practical experience. We get 1,000 applicants per month, but we need excellent communication skills along with the technical qualifications, and that's not easy to find."

> "WE NEED to find people in human resources with a minor in computer science."
>
> CATHERINE DITAMORE
> ARA SERVICES, INC.

Teaching without teachers

Some organizations have found a way to circumvent the teachers and the classroom altogether. At McDonnell Douglas Helicopters, Inc. in Mesa, Ariz., Steve Reese, administrator of training information resource management, realizes that the 365-member MIS department runs in a crisis management mode. Getting people into a classroom for three days, or even eight hours, is tough. So Reese sets up all training on video or computer-based training (CBT), tailored to meet individual needs within MIS.

This modular approach provides an MIS employee with the option of doing the course on a Saturday or off-hours during the week. "I'll find the training to fit your style of working," Reese says to MIS. "It's the only way MIS can get trained. Very few go outside for courses."

Reese admits that such packaged courseware does present drawbacks. Improving skills of project leaders, for example, is difficult to do in that fashion. But Reese and his staff have started giving a battery of tests to project leaders in order to isolate the individual's needs. From these tests, a course is custom-designed for that person.

McDonnell Douglas's Reese

Beyond the cost savings of video and computer-based training (CBT), Reese says he believes there is added value in the speed with which training is made available. "In the real world, when someone has a need, say, to take an effective writing course, they would need company approval and time to register, and the whole process could take eight months. With a CBT course, we can get training to someone within 24 hours, and they can do the course on their own."

Securing a budget

Convincing senior management to finance MIS education is tough in firms faced with a difficult economic forecast. The tendency is to push MIS to participate in companywide training efforts rather than seek its own education programs. At Riggs National Bank, Cavanaugh admits that concern has been expressed by some MIS professionals about the tight education budget. But there has been no increase in turnover, nor has it stopped the bank from attracting qualified people.

"It's a constraint, but it doesn't chase people out of here," Cavanaugh says. "I think some of this is overblown, people just getting trained to broaden themselves rather than focusing on the benefit to the company."

Nonetheless, education represents another opportunity to gain a competitive edge, and that makes it a necessity to some.

"The key challenge today is keeping people technically sound and increasing their business skills," DEC's Cross says. "Even at the most basic levels, if you don't know where the business is going, what's the sense of having technology at all?" ●

Systems education that really works!

At last: Hands-on systems education courses that confer *real* comprehension, *real* competence, in all 370 system architectures.

Completion of any course lets your people begin applying what they've learned immediately. So you'll see a greater level of self-sufficiency, as well as increased productivity.

Just a few of the courses available right now include:

amdahl

amdahl

SMART

Amdahl Corporation
1250 East Arques Avenue
Sunnyvale, CA 94088-3470

RECEIVED
MAY 2,19
BIDS & PROPOSALS

R. F. P.

Project AIMS
(Advanced Information Management System)

Computing System Proposal
for
State Government

Dave-
This is my first
pass at responding to
the RFP. This is a
great fit for our products
and services. (These
responses will apply to our
local government RFPs too.)
-Your reactions?
Rob 5/6

ROB -

GOOD THOUGHTS. I'VE ADDED
SOME COMMENTS. FOCUS ON
WANG'S COMMITMENT,
SOLUTIONS, AND SUCCESSES
IN STATE AND LOCAL
GOVERNMENT.

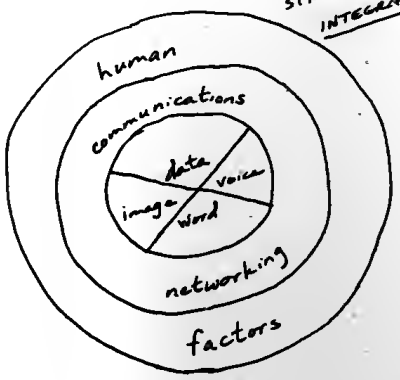
DAVE 5/9

MAKE SURE THEY UNDERSTAND THAT OUR OVERALL STRATEGY IS STRUCTURED ALONG THE SIX CUSTOMER NEEDS | SIX TECHNOLOGIES:

1. SYSTEMS FOR TODAY AND TOMORROW
2. COMPLETE SOLUTIONS
3. MULTI-VENDOR ENVIRONMENTS
4. REALIZATION OF PAST INVESTMENTS
5. SENSITIVITY TO THE USER
6. LONG-TERM RELATIONSHIP

(OUR CUSTOMERS HAVE TAUGHT US HOW ESSENTIAL THESE ARE!)

SIX KEY TECHNOLOGIES – INTEGRATION IS KEY.



This is a representation, not an actual Request for Proposal. It is designed to demonstrate Wang's ability to meet the challenges that face state and local government. It is intended to provide summary information for data processing and state and local government professionals.

We welcome your comments and invite your input.

Background

This government is committed to providing the highest level of constituent service possible. In order to accomplish this, this government intends to procure an advanced information processing system designed to achieve the following:

- o effectively and efficiently manage resources
- o adhere to budgetary constraints
- o improve constituent service
- o increase effective and timely communication among agencies and departments
- o provide managers the ability to retrieve and use a wide variety of information to support decisions.

SHOW HOW WANG'S TOTAL COST OF OWNERSHIP (TCO) IS LOWER THAN OTHERS BECAUSE OF:
- SEAMLESS UPGRADE
- CONSISTENT USER INTERFACE
- MINIMAL ADMINISTRATION COST (NO SYSTEMS PROGRAMMERS)...ETC.

Vendor must have sufficient government information processing experience to respond effectively to government's specific needs, including:

- o government's rigid safety and security requirements
- o departmental software solutions.

Wang Response

Wang Laboratories, Inc. has a tremendous amount of experience with all levels and sizes of government. Wang is currently meeting the application processing needs of thousands of customers in the state, local and federal government. Fifty state governments have installed Wang computers, including more than 35% of the Governors' offices, 35% of the Legislatures, 26% of the Supreme Courts, 45% of the Attorneys' General Offices, 25% of the Finance and Budget Offices, 22% of the Health Departments, 20% of the MIS Departments, plus many others. Hundreds of small to large local and county governments are using Wang systems, from the finance and administration areas to the schools and police departments. Many federal departments and agencies have awarded large contracts to Wang in the areas of defense, national security, health, human services and others.

Using the Wang VS minicomputer, departments and agencies can provide access to other government and nongovernment users while ensuring adequate security measures to prevent access to confidential data.

The family of Wang VS 32-bit processors with extended security access control option provides:

- *event logging and violations*
- *scheduled user access time*
- *last logon notification*
- *password encryption and suppression*
- *user time out*
- *single or multiple logon.*

MENTION THAT WE LEAD ALL VENDORS IN SECURED PRODUCTS FOR THE FEDERAL GOVERNMENT (APPEND PREFERRED PRODUCT LIST DATA).

Wang has a wide range of applications software developed and implemented through specialized third-party software providers. Wang also can identify numerous public-domain solutions developed by our governmental customers. Solutions are easy to modify and fit the needs of both large and small government customers. Most systems are designed to adapt to various statutory requirements through the use of table-driven parameters. These applications are currently available, but are not limited to the following government departments/agencies/functions:

- *Chief executive & elected official*
- *Legislative/policy development*
- *Civil and criminal justice*
- *Integrated financial services and administration*
- *Human services*
- *Mental and public health*
- *Environmental services*
- *Public works*
- *Education*
- *Economic development*
- *Public safety.*

DESCRIBE CASES WHERE WANG SYSTEMS SAVED GOVERNMENTS HUNDREDS OF THOUSANDS AND ALLOWED OTHERS TO ABSORB INCREASED WORKLOADS (E.G., DDS, PORT AUTHORITY, ETC.)

Integration Requirement

The project requires multi-vendor networking capabilities, data access and inquiry, and integrated DP/WP capability using electronic mail. Vendor must demonstrate seamless bridges into industry standard protocols, which will enable the managers and professional staff to use and analyze appropriate information, regardless of where that information resides. Vendor must also allow users to integrate information from spreadsheets, word processing, data processing, etc. into a meaningful report or other format and send and exchange that information among appropriate users and departments.

Wang Response

EMPHASIZE THIS POINT

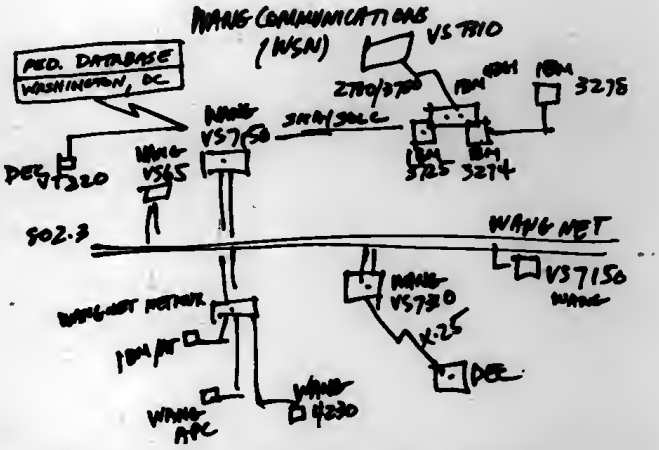
Wang's systems are designed to enable you to maximize your past investments in existing Wang and non-Wang systems. The Wang solution employs an integrated strategy for large-scale systems networking. Wang Systems Networking makes transparent the differences in the local and wide area networking protocols, therefore providing seamless communications across the entire organization. Wang not only connects the government's network through multi-vendor integration, but also provides the ability to manage and administer the network as well.

Warg's solution accomplishes this by means of the Distributed Management Facility, which manages both the Wang implementation within the building and the wide area network. All network management can be centralized at the system operator's console or decentralized as required, from host level to terminal. The operators can run backups and download new versions of code, all from the network control center.

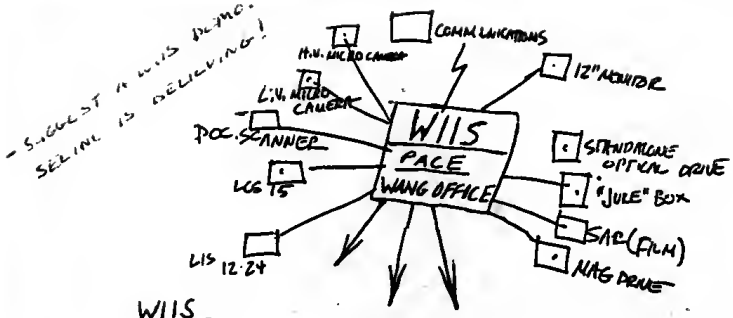
WE HAVE STATES WITH UP TO 35 VS'S AND OVER 250 USERS TIED TOGETHER REQUIRING ONLY 1 TO 2 OPERATIONS SUPPORT PEOPLE.

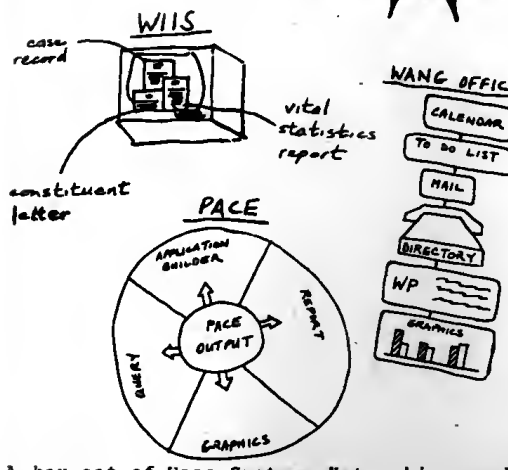
As to standards, Wang solutions conform to de facto and generally accepted industry standards, including:

- *SNA/SDLC*
- *RJE 3777*
- *2780/3780*
- *CCITT X.25*
- *IEEE 802.3*
- *TTY*
- *VT100*
- *LU6.2.*



- SUGGEST WHAT WE'RE DOING. SELLING IS BELIEVING!





IT'S THE INTEGRATION OF THESE CAPABILITIES THAT COUNTS!

A key set of Wang Systems Networking applications to be provided as part of this solution is Wang OFFICE. Applications include:

- o Electronic mail
- o Event scheduling
- o Document filing and retrieval
- o Cross-library summary and words-in-text searching capabilities
- o Computer-based training for all features.

TOO BLAND! MAKE THE POINT THAT WE INTERFACE WITH PROFS, DISOSS, ALL IN ONE, ETC.

All document files created on the system can be transmitted to other Wang and non-Wang systems by means of commonly available network transport products, including multipoint, point-to-point, X.25 and Wang Band.

Vendor must provide application development tools, productivity tools and the ability to effectively manage databases, and an easy-to-use and powerful inquiry tool and ad hoc report generator. Non-technical users must be able to use and access them. This government considers it essential to eliminate current applications backlog and to be responsive to departmental requests for system enhancements and new applications. An important goal is to reduce input redundancy and streamline management of databases. Vendors should present their capability in the area of imaging and image processing, especially as it applies to the wide variety of forms and documents typically stored in paper form or on microfilm.

Wang Response

Wang's fourth-generation language, PACE, uses a relational DBMS which allows the entire government user community to share select data pertinent to their work as elected officials, agency managers, professional staff, etc.

PACE is unique in its ability to manipulate data, text, voice, and image files. PACE also allows users to develop complete applications without needing the skills of a professional programmer.

Wang, as part of the strategic relationship we propose, will provide a comprehensive needs analysis in order to best apply PACE in the environment.

When compared to traditional development methods, PACE provides significant reductions in application development lead times. PACE is an effective tool to allow government to reduce, if not eliminate, its applications backlog and respond quickly to departmental data processing needs.

WIIS, Wang's Integrated Image System, is a comprehensive system for managing, processing, and communicating text, data, and imaging information. The government can capture documents in image form, such as constituent correspondence, case and client information, tax and revenue documents, land, auto, and other registrations, vital statistics records, etc. that are currently stored in paper form.

These digitized images or "photocopies" are quickly and easily retrieved by the user as part of an integrated information system through a single workstation. Along with access to a mainframe window, a Wang VS window provides the government professional all the documentation necessary to provide service or make a decision or recommendation.

As government anticipates that information processing requirements will significantly increase over time, vendor must describe growth path for CPU's, peripherals, and software.

AND WE HAVE WORKED HARD TO MAINTAIN AN INTERNALLY CONSISTENT ARCHITECTURE FOR OUR CUSTOMERS - WE HAVE LISTENED TO THEM!

Wang Response

Wang's family of VS 32-bit processors provides you a seamless upgrade path, allowing you to use the same workstations and peripherals as you upgrade CPU's.

For more than a decade, Wang has maintained a consistent user interface. Additionally, because of our architecture and corporate commitment to preserving our customers' investment in applications software, only minor changes are required to run programs that may be ten years old.

Wang's design strategy has also historically been sensitive to human factors. Therefore, Wang will offer a solution which does not require replacement of familiar systems or complicated retraining as the system grows.

Government wishes to employ state-of-the-art voice response capability. Vendor should describe their offerings in this technology.

Wang's Response → GIVE ACTUAL EXAMPLES OF REAL USES OF STEP.

Wang's solutions incorporate leading-edge constituent access capabilities. Wang STEP (Speech and Telephony Environment for Programmers) transforms a constituent's telephone into a vehicle to access database information. Constituents, through their touch-tone telephones, are able to access information relevant only to their particular needs, such as case status information, pension fund information, bill status, schedule of events, forms ordering, etc. In addition, Wang is ready to work with government to develop a broad range of public information systems, public input mechanisms on a variety of governmental issues, and increase first-hand constituent-government communications.

DISCUSS ALL VOICE OFFERINGS:
(1) DVX
(2) CUSTOM VOICE APPLICATIONS
(3) DVX II
(4) VOICE BULLETIN BOARD

} → NEW PRODUCTS - AVAILABLE 5/88

WANG

Call 1-800-522-WANG

Wang Makes it Work.

Voice technology speaks for itself

Radiologists, warehousers and sales reps put voice to work — with a one- to two-year payback

BY DANIEL LALONDE and A. DUANE DONNELLY

It is 10 o'clock on a Thursday evening. An eager investor wants to retrieve several stock quotations, financial news and associated reports even though it is after business hours. He dials a special telephone number provided by his brokerage firm and is answered by a computer-synthesized voice. He asks for the information he requires, and the system responds to his queries with yes/no answers. Satisfied with the response he gets, he will invest tomorrow. Using voice technology, the broker has improved customer service and access to information.

Teddy bears, operating rooms and automobile production lines as well as brokerage firms are being fitted with the latest twist in computer technology — devices that understand and simulate human speech.

The market for voice recognition and voice synthesis in North America in 1987 was between $50 million and $70 million, according to Larry Dome at the Gartner Group, Inc. in Stamford, Conn. If it grows at the expected compound annual rate of 50%, Dome says, sales of voice recognition and voice synthesis devices will near $400 million by 1991 (see chart page 74).

Cost-effective voice technology applications are being implemented in numerous business areas, including marketing, telecommunications, inventory control, quality control, paperwork automation and security.

Voice recognition converts the spoken word into a digital form that computers can recognize and respond to. The computer understands the words by matching the digital translation to a vocabulary data base stored in its memory. Voice synthesis works the opposite way: It converts digitized computer text or data into analog speech.

LARRY ASHTON

The voice recognition vocabulary data base consists of phrases, words or phonemes — units of sound — depending on the sophistication of the system. Voice recognition systems direct the computer to sample this digitized speech at specified intervals to obtain an accurate picture of what is being said.

Vocabularies for voice synthesis systems are initially constructed by storing basic units of sound such as phonemes and allophones in the memory of the computer.

An algorithm puts these sound units together as words or sentences. As a result, voice synthesis systems theoretically have an unlimited vocabulary. They can output any type of information.

The good news is that the voice market holds great promise. Voice recognition and voice synthesis are facilitating traditional processes such as report generation and device control. Both are also creating new uses for computers, such as personal computer-based telemarketing and production-line control.

The bad news is that most voice applications currently exist only in niche markets, primarily manufacturing, since the technology has a long way to go before it can enjoy widespread business use.

On the voice synthesis side, several major difficulties plague today's technology. First, the voice output still sounds unnatural enough that some end users have compared it with robot speech.

Second, the information voice synthesis systems are required to output has increased dramatically in the past few years, thereby increasing the complexity of the algorithms used to identify words and sentences. Some systems continue to mispronounce new words, misspelled words and proper names.

Negative side

Today's voice recognition systems also have a number of drawbacks. Most systems have only a small vocabulary so that installations in office information systems are relatively rare. Additional shortcomings include problems with background noise and contextual interpretation — mistaking "two" for "too," for example.

The vocabulary size of recognition systems is a problem from two perspectives. First, to input large vocabularies takes a great deal of the users' time. For a speaker-dependent system, each end user must speak each word into the system several times. Second, because digitally stored words occupy a large portion of computer memory, the potential size of a vocabulary is directly related to the amount of memory available. And just adding more memory to the system does not do the trick: It may slow the system down to an unacceptable pace.

Voice recognition systems

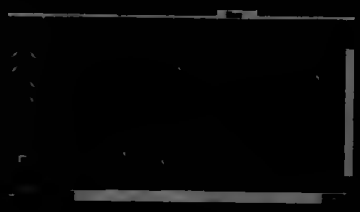
Lalonde is a consultant at Touche Ross & Co. in North York, Ontario. Donnelly is a former Touche Ross consultant.

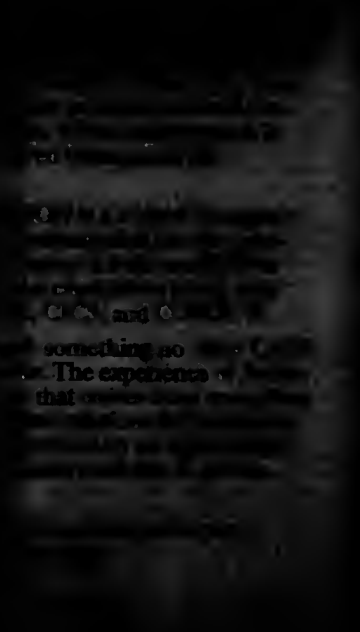
- **Automating paperwork at a Boston hospital**
- **A splashy telemarketing system for a utility**
- **Inventory control for textile mills**

① The CEO wants a completely overhaled customer information system in 9 months.

② marketing needs external research information in their database to keep ahead of the competition.

③ Accounting needs changes to the old system by the next close.



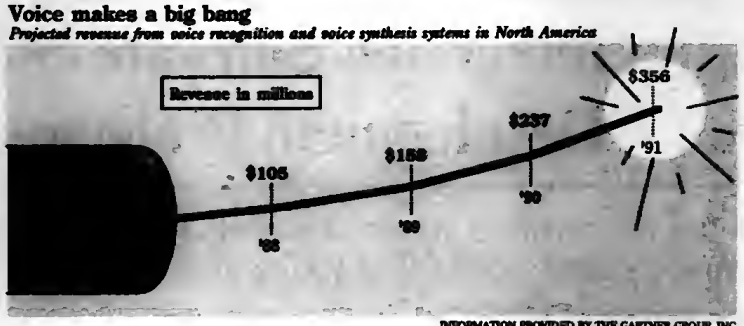


FOUNDATION

that provide speaker independence and continuous speech are currently being tested in the laboratories. However, the numerous variations of each word that must be stored severely limits vocabulary size, since each digitally recorded word occupies a substantial portion of memory. As technology progresses, such systems will be able to handle much larger vocabularies, but speaker-dependent systems are now more common.

Voice makes a big bang

Projected revenue from voice recognition and voice synthesis systems in North America



INFORMATION PROVIDED BY THE GARTNER GROUP, INC.
CW CHART: AMY J. SWANSON

Background noise that causes voice commands to be misinterpreted is another problem associated with voice recognition. If a system is operated in a noisy area or over a poor telephone connection, background sounds are sometimes misinterpreted as data to be input. A high-fidelity microphone in a quiet area solves this problem, but it is clearly not an ideal solution, as it effectively eliminates many high-payoff applications.

Finally, voice recognition's most serious limitation lies in coming to terms with the English language. When interpreting sounds, many systems have difficulty distinguishing between homonyms or phrases that sound similar. Consider the following sentences: "A new display can recognize speech" and "A nudist play can wreck a nice beach."

A new approach to voice recognition is statistical prediction of the next word in a sentence based on the words preceding it — sometimes called a "context expert" because it uses artificial intelligence techniques. This approach has been integrated into some voice systems, but the technology has not yet been perfected to the point of eliminating all errors.

Success stories

Despite the drawbacks, cost-effective voice technology applications have been successfully implemented in numerous business areas.

Marketing and telecommunications. Jersey Central Power & Light Co. (JCP&L), a public utility, has been trying to involve the general public in energy conservation. In search of a proactive marketing technique, it experimented with a voice synthesis system. Customers answered yes-or-no questions by pressing their Touch-Tone phone buttons.

JCP&L used the system until a survey indicated that 47% of its customer base used rotary-dial telephones. To handle this situation, JCP&L brought in the Teleclerk voice recognition system from Valor Telecom Ltd.

The system consists of PCs that use modems to dial numbers from a list of prospective customers. When a connection is made, the system asks the same yes-or-no questions, but it recognizes the responses and records them in a data base.

Valor's system can also pursue a line of questions based on previous customer responses. For example, if the customer answers that he had an energy audit within the last six months, the system inquires if a follow-up appointment is desired.

JCP&L put the Teleclerk voice system to the test by loading it with a list of 4,500 customers to call between 5 p.m. and 8 p.m. In that time, Teleclerk called about 3,156 customers, offering each one a $15 energy audit package.

From those calls, JCP&L received a 5.4% affirmative response, compared with a direct-mail campaign that produced a 1.5% response. At hourly rates of $5 for telemarketers, JCP&L saved more than $500 on salary costs alone in the three-hour campaign.

Inventory control. A large U.S.-based textile mill recently implemented a voice application to aid inventory control. One of the mill's many warehouses stores rolls of carpet that have not yet been cut and dyed. Previously, when a customer placed an order, a forklift operator would retrieve a roll of carpet from a specified location, bring it to the cutting station and

Because Tomorrow's Modems Will Need Tomorrow's ASICs, We're Designing Them Today.

Created by Dayner/Hall, Inc., Winter Park, Florida

return it to its original location after cutting.

This system caused two problems. First, there would often be several more convenient places to store the roll after cutting it, but the forklift operator was required to return it to its original location to ensure that inventory was being tracked accurately.

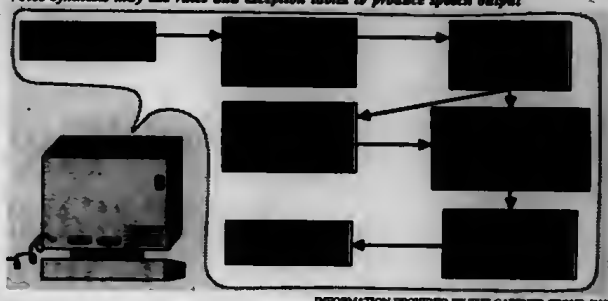
Second, all orders placed on a given day were collected and entered into the PC-based inventory control system the following day. As a result, inventory information was never current during the day, and customer inquiries could not be answered with confidence.

These problems were resolved by combining an existing PC with a voice recognition and synthesis system supplied by Votan. Forklift operators, now equipped with headsets and microphones, receive information from the computer about the type of carpet desired and its location. There is no longer a one-day lag before stock levels are updated, and rolls of carpet can now be placed in the first available location. The system recognizes the operator's commands and keeps all inventory and location records current.

Quality control. Burlington Industries, Inc. is the largest manufacturer of fabrics in the world. Before shipping its products to customers, inspectors must scrutinize the entire fabric and record the number of defects on the computer. If the number of defects exceeds a defined level, the fabric must be reworked. In addition, many defects in a textile could indicate that a particular machine is faulty and needs to be replaced.

How a computer talks

Voice synthesis may use rules and exception tables to produce speech output



INFORMATION PROVIDED BY THE GARTNER GROUP, INC.
CW CHART: AMY J. SWANSON

Burlington now uses a Texas Instruments, Inc. Voice Board to complement the work of the textile inspectors. When a defect is found, the inspector registers the information by talking into a PC with a headset microphone, while a yardage meter device automatically reports the exact location of the defect to the computer.

Since Burlington implemented the voice recognition system, it has identified defective machines sooner and has consequently seen defects decline by 20%. Costs, in turn, have gone down, and customer satisfaction has gone up. The new technology has also enabled Burlington to reduce its labor staff. Management has calculated the payback period to be less than two years.

Data entry. Administrators at University Hospital in London, Ontario, realized that a large amount of time was being spent entering repetitive data. Data entry alone required two employees to process about 4,000 transactions per day.

These tasks are now accomplished more efficiently with a voice recognition system supplied by Roar Technologies. Voice recognition vocabularies have been assembled to allow administrative personnel to enter data with voice commands, a method that has saved time and reduced entry errors.

The hospital has reduced its staff by two data entry operators, which translates into a $30,000 recurring annual savings. As an additional benefit, job satisfaction increased with the elimination of cumbersome keyboard data entry. The productivity of the hospital administrative staff has also risen.

Paperwork automation. The radiology department of a New England hospital derives a large part of its revenue from helping insurance companies verify that patients have legitimate reasons for submitting insurance claims. Staff radiologists spend much of their time making diagnoses based on X-ray films from patient examinations and are reimbursed for this service by the insurance companies upon receipt of a typed report.

In the past, turnaround time for typing these reports was slow, delaying the collection of revenues from insurance companies.

The typing bottleneck was removed by implementing a PC-based voice recognition system from Kurzweil Applied Intelligence, Inc. (see story page 79). As a radiologist examines X-ray films, he now dictates his diagnosis directly into a headset. The report appears on the monitor of the PC as it is dictated, and any mistakes are corrected immediately. Once a report

Evolution in datacomm systems is driving the evolution in Application Specific Integrated Circuits... and UDS is a step ahead! We're not an integrated circuit company, but our commitment to ASIC design exceeds that of many semiconductor producers.

Why? Because we believe that modem people can anticipate modem performance needs better than IC people can. And because we know that UDS people, working to UDS standards, will keep us — and you — ahead of the intensifying cost, quality and performance demands of tomorrow's datacomm systems.

If you're designing, integrating or managing in an atmosphere of datacomm evolution, you need the modem provider who's a step ahead. For product details, contact *Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Telephone 1-800-451-2369 or 205/721-8000; Telex 752602 UDS HTV.*

Universal Data Systems
MOTOROLA INC.

The Sudden Appearance Of Network Carpetbaggers.

Beware of "Johnny-Come-Lately's" who talk a good game but don't hold all the essential cards.

It's a rough world out there for anyone trying to make an educated buying decision–the right decision–about communication networks.

On top of sorting out your own needs against constantly shifting carrier regulations and rapidly evolving technology, there's the problem of sorting out the vendors, the claims, the promises–all of which seem to be multiplying faster than fat cats around spilled cream.

So, how can you travel through this world of fantasy and smoke, negotiate the risks, and arrive at a successful network strategy?

Learn to ask the right questions.

How To Avoid Network Carpetbaggers.

Ask the right questions. We'll give you a few to get started. And while we're giving you questions, we'll also give you answers. The General's answers. We believe you'll find they're the right answers to the right questions. And that they'll help you separate the "Serious Contenders" from the "Great Pretenders" in your search for a qualified network partner.

How long have you been developing data communications products and network strategies?

The General introduced its first modems, data sets and multiplexers in 1969. Communications, from small systems to multi-national networks, has been our only focus since that time.

How big is your installed T-1 customer base?

The General has the largest installed T-1 customer base in the industry.

What distinguishes you from all other network vendors?

We're a true, single source solution. We can design, build, stage, test, install, manage, service and upgrade your network and never lift the phone to dial a third-party vendor. Not for products or services.

What distinguishes your network products from everyone else's?

The General's *entire* network product line stands apart for three reasons: it was developed within a strategic framework that anticipates regulatory changes and options; it was developed for global operations within a systems context, thus each element not only serves specific functions, but also critical network management and control requirements; and it was designed to provide long-term flexibility to meet the challenges of growth while maximizing the initial systems investment.

"The General's entire network product line was developed within a strategic framework that anticipates regulatory changes and options."

How do you ensure that your network products reflect emerging standards and opportunities?

The General has an entire staff dedicated to tracking trends and forecasting regulatory changes. That allows us to develop technology that maximizes network options. Typical of that is our development of MEGASWITCH®, the industry's premier DACS compatible T-1 multiplexer, which allows our network partners to take full advantage of AT&T's current and future public service offerings without sacrificing the benefits of private networking. It gives them the best of both worlds, all under the control of a single network management system.

How can you ensure my network's integrity?

You can only ensure network integrity by building it in from the smallest system level to the largest. By designing and manufacturing all the elements you need to build a network, we're uniquely positioned to deliver products developed within a systems framework. Products that feature true backward and forward compatibility, true pinpoint accuracy in locating and recovering from systems failures. Products that, when joined together in a tightly designed network, give you total network management–down to desktops–from a single central site.

Can you support and service my network?

The General's Network Services Division offers comprehensive, worldwide systems integration, support and maintenance–all under the supervision of assigned, dedicated program managers. You'll never have to worry about who to call or what to do when you have a problem. And you'll never have to sit on your hands waiting for it to be solved.

"You can only ensure network integrity by building it in from the smallest system level to the largest."

Get More Of The Answers You Need.

Call the General, General DataComm, and find out more of what you need to know. Call the number below and, for starters, we'll send you our TRUTH OR CONSEQUENCES wheel. It's a handy tool for learning the TRUTH about network vendors *before* you pay the CONSEQUENCES.

And when you call, ask to see one of our sales representatives. They've got a lot more questions–and answers–that can help you distinguish the big players from the big talkers in communications networks.

And these days, you need all the help you can get.

1-800-777-4005

In Network Strategies, There's Only One General™

General DataComm
Middlebury, CT 06762-1299 (203) 574-1118

SEE US AT ICA 88 BOOTH #2350

is ready to be sent to an insurance company, the radiologist issues an oral print command, and the report is printed.

The time spent filling out and printing a report has been reduced from 15 minutes to 30 seconds. Reports issued to insurance companies are processed faster and the associated revenues are collected sooner, strengthening the hospital's cash-flow position.

Feasibility framework

Voice technology systems are relatively inexpensive. Small-vocabulary — less than 1,000 words — voice recognition hardware and software components, including a microphone, typically cost between $2,000 and $6,000. Voice synthesis systems, including a speaker, are also in the $2,000 to $6,000 range.

With such a low-cost investment, determining whether voice technologies are a feasible solution does not need to be a costly, lengthy task.

Nevertheless, care should be taken to ensure that voice technology will pay off in both the short and long term and that the organizational implications of the technology are properly addressed. The following framework presents five basic steps of conducting a feasibility study for voice technology.

Step 1: Identify and examine potential voice technology applications. Examples of high-potential units to be considered are production, marketing, distribution and finance. Key indicators of potential include the following:

- Repetitive tasks.
- Data entry functions.
- Processes requiring workers to use their hands while simultaneously recording observations, such as finished-goods inspection.
- Processes that are performed by disabled personnel.
- Multiple processes performed simultaneously by a single employee.
- Stock quotations or telephone directory assistance.
- Expert information retrieval.

Step 2: Identify and prioritize potential benefits and drawbacks of voice technology. Possible benefits include the following:

- Increased security.
- Job enrichment and improved morale.
- Reduced training costs.
- Increased productivity.
- Reduced labor costs.
- Greater data accuracy.
- Competitive advantage.
- Increased customer satisfaction.

Obviously, not all benefits will apply in all cases. Among the possible drawbacks are:

- Initial costs.
- Employee resistance.
- Malfunctioning newer products.

Step 3: Quantify benefits and drawbacks. The benefits and drawbacks identified in Step 2 should be quantified to aid in calculating an investment payback period.

For example, in a large textile firm, finished-goods inspection currently identifies five defects per 100 yards of textile, on average. With voice technology in place, the company expects to detect defects more quickly and hence locate and repair the source of the defects — such as a defective machine — sooner.

The firm expects to reduce the number of defects by 20%, or one defect per 100 yards, which will in turn reduce the labor and machine costs that are incurred to rework defective material.

The reduction in defects will lower the cost per yard of nondefective textiles for the firm, and the company projects a significant increase in gross profit as a result. If the company's sales remain the same, this favorable impact on gross profit is expected to translate into a $12,000 increase in net annual profit.

Step 4: Determine the payback period.

Research shows that many voice applications have a technology payback period of less than two years. Assuming that the textile firm in the previous example purchased a $6,000 voice technology system and receives $12,000 in recurring annual benefits, its payback period would be six months.

Step 5: Make feasibility decisions.

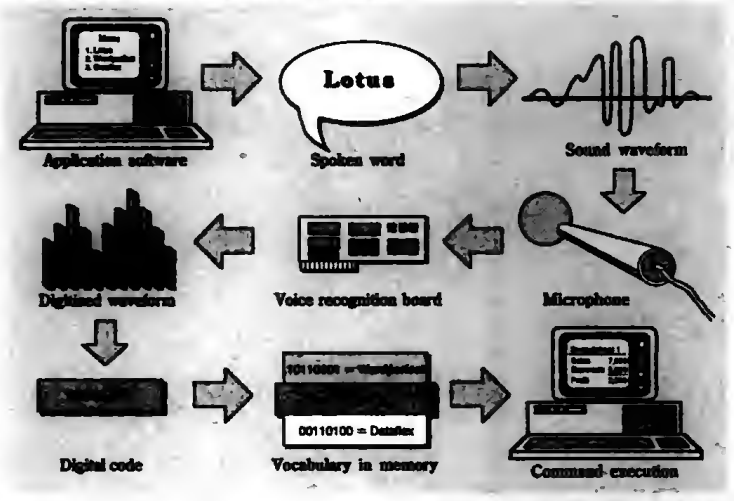
Based on the payback period and intangible factors, such as company image and employee morale, a final decision can be made on whether it makes sense to acquire voice technology.

The voice technology industry is still in its infancy. Voice recognition systems providing speaker independence and continuous speech are under development; they are predicted to become a usable application in the near future.

Meanwhile, as the output quality of voice synthesis systems improves, the number of applications will also expand, particularly in combination with other voice processing systems. •

How does a PC understand you?

In this simple application of voice recognition, a user can choose from a menu and speak the choice aloud, and the computer will retrieve that program from storage



INFORMATION PROVIDED BY TOUCHE ROSS & CO.

Presenting someone who actually knows what the world's coming to.

John Naisbitt. Celebrated authority on future trends in society and business. And keynote speaker for the first of a series of Wang satellite TV broadcasts on Thursday, May 26. Mr. Naisbitt, along with a panel of industry experts, will discuss "Megatrends: Communications Standards." They'll not only explore the effect such standards will ultimately have on business, but why you should know about them today. The fee for participating in this special live broadcast is $195. To register, or for more information, call 1-800-543-5551. You'll not only discover what the world's coming to, but where your company's going to be.

John Naisbitt, author of Megatrends and Reinventing the Corporation.

WANG

VSAM-LITE

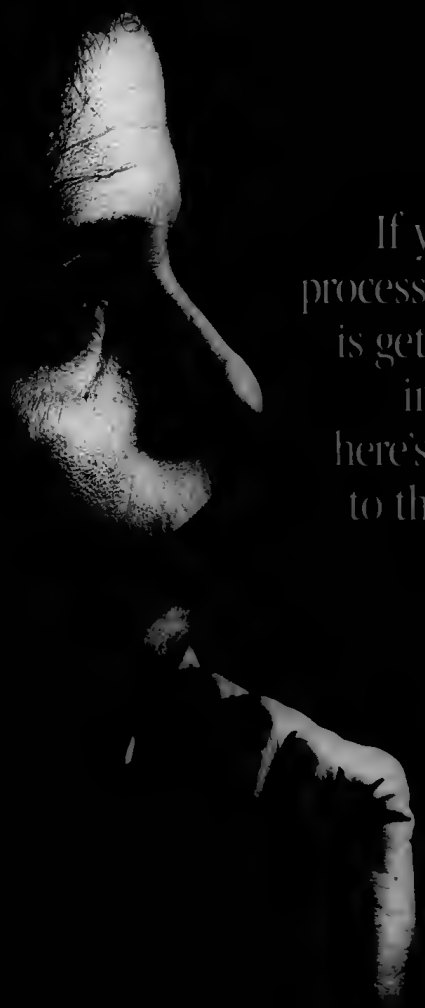
Automatic Data Compression for VSE

- Saves VSAM space by 50% or more
- Reduces DASD I/O activity, improves system performance
- Improves on-line response times; Speeds tape backup's
- Easy to use...requires no JCL or program changes
- Analysis utility forecasts actual space savings

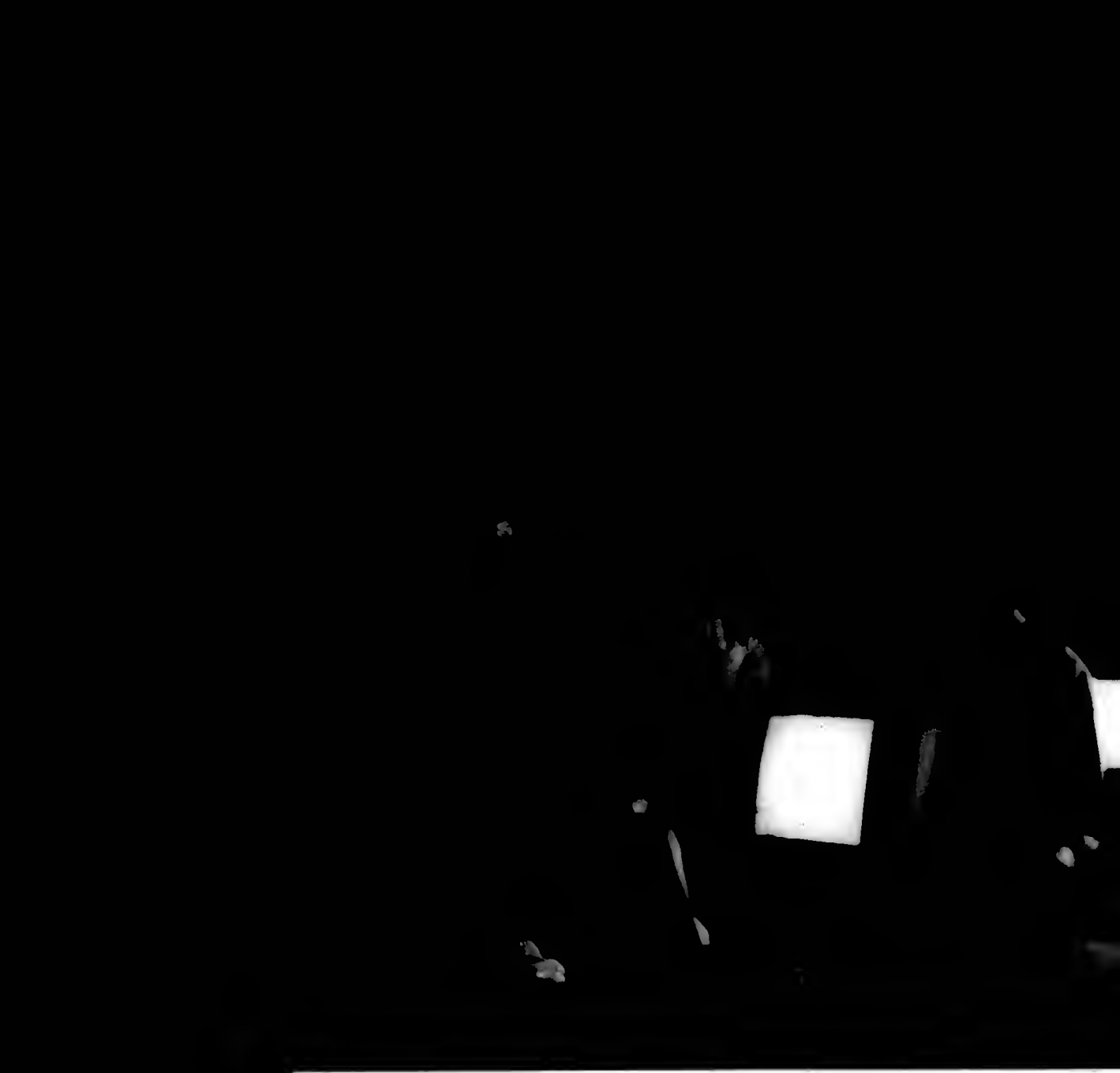
Call now for your FREE copy of the Compression Analysis program that will show how much disk space your installation can save by using VSAM-LITE.

CALL...
Toll free (800) 243-9542
in Conn. (203) 792-5100

Universal Software
Brookfield Office Park
Brookfield, CT. 06804



If your data
processing operation
is getting buried
in paper,
here's something
to think about.



Solving your document storage

In spite of the tremendous impact of computers and electronics, the modern data processing environment is still mostly paper. In fact, well over 90% of the data you handle right now is generated on paper. The trouble is, your processing center is probably already overwhelmed by the sheer volume of information. In a variety of different data formats. And that complicates, not only your document storage application, but image and transaction processing, as well.

In short, data processing has evolved into an unprecedented set of complex tasks and problems. Into what's fast becoming known as "Compound Data Processing."

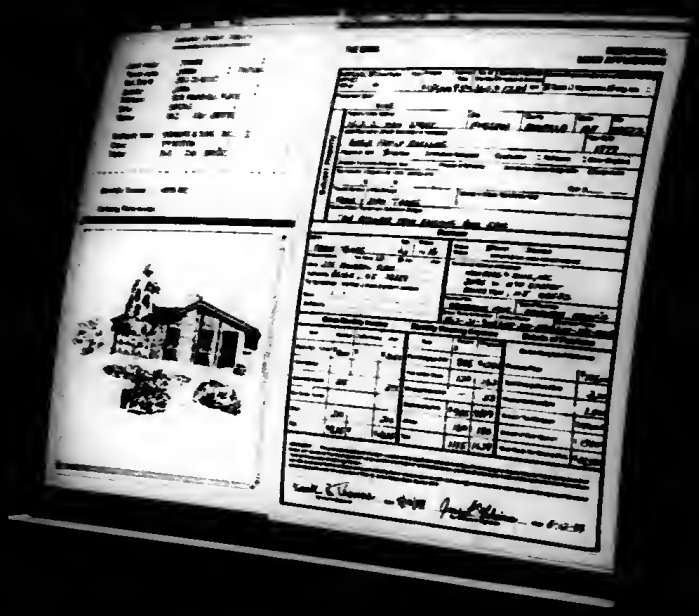
Improving your document storage and retrieval capability will certainly help. But a better solution would be a system that would allow you to control and manage a variety of applications. Without making your present computer systems obsolete. That solution is XDP,™ the Extended Data Processing System from Plexus . . . the one system designed specifically for today's Compound Data Processing environment.

A complement to your present systems, not a replacement.

XDP is an open, information management system that connects easily to your present mainframe and other computer systems. With XDP you have the ability to capture, store, catalog, manipulate and retrieve image, text and alphanumeric data. And, since XDP incorporates an open architecture and integrates industry standard hardware and software, you'll be able to quickly adopt new technologies as they become commercially available.

Create sophisticated applications, 10 to 20 times faster.

With the XDP Applications Designer, users and programmers can develop sophisticated database applications in days, not months. The Applications Designer includes an innovative User Interface Builder, based on MS-Windows,™ that's fully integrated with the System's standard fourth-generation language and relational database.



problems is just the beginning.

Flexible enough to provide what you need today. And tomorrow.

A flexible system is a must in today's complex data processing environment. And flexibility will be even more important in the future. That's why XDP is both modular and expandable. The core of the System, the XDP DataServer, contains an expanded relational database management system (RDBMS) and uses standard SQL as its interface. The RDBMS seamlessly manages a variety of data types—including image, text and alphanumeric.

The XDP WorkStations are enhanced PC/AT-™ compatible personal computers, which run MS-DOS.™ And the System can be equipped with whatever peripherals your operation requires. From optical disk drives and optical disk jukeboxes to high-speed image scanners, facsimile communications, optical character recognition (OCR) devices, and laser printers. Get the specific capabilities you need right now. Add others whenever you wish.

Talk with us.

We know that identifying your specific data processing problem—not to mention determining the right solution—can be difficult. But we can make things a lot easier. We've already done it for an extensive list of government and commercial clients around the world. Perhaps all you need to do is improve your document management capability. Perhaps you need a complete integrated Compound Data Processing solution. Either way we can help. Just mail in the enclosed response card, or give us a call: 1-800-538-8157, ext. 937, or 800-672-3470, ext. 937, (inside CA). Plexus Computers, Inc., 3833 North First Street, San Jose, CA 95134.

PLEXUS

Redefining data processing.

Plexus and XDP are registered trademarks of Plexus Computers, Inc. MS-DOS and MS-Windows are registered trademarks of Microsoft Corporation PC/AT is a registered trademark of IBM Corporation. Copyright 1988 Plexus Computers, Inc.

Worldwide Sales and Service Offices.

Corporate Headquarters: 3833 North First Street, San Jose, CA 95134 (408) 943-9433

Eastern Region

Princeton Office: 210 Carnegie Center, Suite 101, Princeton, NJ 08540 (609) 452-8877

Boston Office: 70 Walnut Street, Wellesley, MA 02181-2199 (617) 239-8239

Atlanta Office: 2310 Parklake Drive, Suite 300, Atlanta, GA 30345 (404) 938-4038

Central Region

Chicago Office: 2001 Midwest Road, Suite 106 Oak Brook, IL 60521 (312) 627-5300

Detroit Office: 400 Renaissance Center Suite 500, Detroit, MI 48243 (313) 259-4060

Minnesota Office: 5200 Willson Road, Suite 107, Edina, MN 55424 (612) 922-5122

Dallas Office: 9330 LBJ Freeway, Suite 240, Dallas, TX 75243 (214) 437-5551

Houston Office: 16800 Imperial Valley Drive, Suite 220, Houston, TX 77060 (713) 820-4220

Western Region

Santa Clara Office: 5201 Great America Parkway, Suite 429, Santa Clara, CA 95054 (408) 748-0400

Los Angeles Office: 5455 Garden Grove Boulevard, Suite 375, Westminster, CA 92683 (714) 891-4717

San Diego Office: 4350 Executive Drive, Suite 211, San Diego, CA 92121 (619) 535-8171

Denver Office: 5299 DTC Boulevard, Suite 500, Englewood, CO 80111 (303) 721-0101

Federal Marketing Group

Virginia Office: 8614 Westwood Center Drive, Suite 620, Vienna, VA 22180 (703) 893-4633

International Subsidiaries

United Kingdom

Plexus Computers Ltd.: 16 Cherry Orchard West, Kembrey Park, Swindon Wilts, England, SN2 6UY 44-7936-14110

France

Plexus Ordinateurs: 1 Avenue de la Prefecture, 91000 Evry, France 33-1649-79417

West Germany

Plexus Computers GmbH: Bahnhofstrasse 6, 6251 Hahnstatten, West Germany 49-6430-2217

Australia

Plexus Computers (Australia) Pty Ltd., Melbourne Office: 260 High Street Kew, Victoria, Australia 61-3-690-3233

Sydney Office: 600 Military Road, Mosman, New South Wales, Australia 61-2-969-1688

PLEXUS

Redefining data processing.

Yes, I'm interested in Compound Data Processing Solutions from Plexus.

Industry

- ☐ Banking/Finance
- ☐ Insurance
- ☐ HealthCare
- ☐ Telecommunications
- ☐ Government
- ☐ System Integrator
- ☐ VAR/OEM
- ☐ Other _____

Application/Requirement

- ☐ Records Management
- ☐ Transaction Processing
- ☐ Document Storage & Retrieval
- ☐ Forms Processing
- ☐ Image Processing
- ☐ Other _____

☐ Please have a sales representative contact me.

☐ Please send me information on your Extended Data Processing (XDP) System.

Name _____

Title _____

Company _____

Address _____

City _____

State/Zip _____

Phone No. _____

PLEXUS

Redefining data processing.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 7652 SAN JOSE, CA

POSTAGE WILL BE PAID BY ADDRESSEE

Plexus Computers, Inc.
Corporate Communications
3833 North First Street
San Jose, CA 95134-9952

Pros and cons of voice systems

Kurzweil Applied Intelligence, Inc. was the first voice recognition vendor to offer a large vocabulary system, one with more than 5,000 words. The Waltham, Mass.-based company is also one of the few voice vendors to offer customers full applications such as report generation.

Voice Rad and Voice Em — applications for radiologists and emergency medicine physicians, respectively — prompt doctors through a report on each patient's visit. The doctor is freed from scribbling the report; the hospital is freed from paying for transcriptions; and administrators gain immediate access to digitized data on patient care.

Kurzweil also sells the voice system itself, KVW, and a report shell called Voice Report. Bob Steingart, manager of product marketing for Kurzweil, recently spoke with *Computerworld* Senior Editor Amy Fiore about how a customer might implement a voice system.

What is the payback period for a voice system?
Most of the doctors we're working with say the system can pay for itself perhaps in a year, just based on salary savings, not even factoring in the benefits of getting the report done more quickly. Doctors nationally spend $10,000 a year for transcription, but in radiology, the cost of transcription is much higher than that — $20,000 to $30,000 a year just in salary for a trained, technical transcriptionist. Our system costs in the range of $20,000 to $25,000.

That's specifically for Voice Rad, but in most cases we look at a one- to two-year payback.

Is it the doctors or the hospital administrators who are the advocates for installing a voice recognition system?
In many cases, the administrator is more excited than the doctors, because administrators have costs on their minds, and they're the ones who always get beat up about how long transcription takes, how much it costs, how it threatens a hospital's accreditation if it can't get reports done on time and how billing can't be done without the reports.

What other applications will you offer?
We see a lot of areas in the medical field: internal medicine, pathology, surgical notes, ophthalmology. That is driven by proven need and cost justification. In some areas, even when a large vocabulary voice system solves a problem, it's not cost justifiable.

In all of these areas, are you still targeting professionals, not clerical staff?
Right. I wouldn't rule out anything, but we've found that in the clerical area the problems and the cost justification just aren't the same. If you have someone who makes $50,000 a year, increasing their productivity significantly means more.

What about hands-free order entry?
Some of our customers are doing voice data entry, but I have yet to see any of those applications really take off. It's not because it didn't work — it really relates to cost justification.

Would a speaker-independent continuous-speech system be so much faster than typing that it would be cost justifiable?
It would help. The other thing we've found with order entry is mirrored by some of the other areas. The typical installation is a $200,000 installation, of which the voice part costs between $2,000 and $5,000.

The so-called simple data entry application would always start off simple, but it turned out that the application really had to be tied into an MIS system and a material requirements planning system and so forth.

Probably the next general area that fits into the model that we're working in is the legal field. Some of the attributes are [that] it's got professionals who have transcription problems, and there are lots of words.

We will also make the Voice Report system more robust and supply a bigger suite of development tools with it.

What kinds of companies are developing their own voice systems using Kurzweil's development tools?
There's a large insurance company with a very large MIS staff, which is an integral part of their business. They are evaluating the technology for report generation from their agents out in the field. That's being driven by the MIS group's advanced technology section working with their own end-user clients.

As far as a profile of good applications goes, if you're doing reports that are somewhat repetitive in nature and particularly if there's a high volume of these reports and they're time-critical, then you may have an application that is not just interesting but also cost justifiable.

How can you integrate the data from your personal computer-based system into a host data base or host-based network?
We're doing a project right now with the Veterans Administration in a number of sites across the country. In that approach, we bring patient demographics in from the mainframe.

The doctor enters the patient number and then a file is brought down with the patient's name and other relevant information right into the report. The doctor speaks the report as he does the exam, and when he's done, instead of saying "print this," he says "send this" and sends it back to the mainframe. From there, it's accessible throughout the hospital.

Bob Steingart

Do you sell software that will retrieve information from the host data base?
We have some of that. That really gets more into traditional PC issues — it has nothing to do with voice recognition. So the way I answer that is, in a hospital, if you have a PC that hooks up to the mainframe and you can get information and send it back, then adding voice to it isn't a big deal.

What sort of physical security or data security is there for systems that upload to a host?
In terms of access, right now you have to identify yourself to the system, and it has your voice profile stored on it. In terms of security, I go back to the same answer: Whatever security is available right now is what you can have. Just think of it as another terminal out there.

Which takes longer: training the end user to use the voice system or training the machine to the user's voice?
The voice training takes about two hours in doctor applications, and we're finding that's much less of an obstacle than we even imagined. Most doctors within a day can start generating reports.

Since end users have to read words into the system to train it, does a list of words come along with the application?
Yes. In fact, the biggest thing we found out in the past year or so is what it takes to build a successful application: We had to build a knowledge base.

We started off thinking it was a list of words and quickly found out the list of words is the easy part. What we added then are two things. One is what we call "trigger phrases," which are like voice macros. The system knows about the application, so if you're in a head CAT exam and you say "normal," a whole sentence comes up on the screen. This way, a doctor can get a report done very quickly.

But they have to learn the trigger phrases.
Right, but most of them really mirror what the doctors do right now. Most radiologists dictate today, and a lot of them have really developed a kind of verbal shorthand with their transcriptionists anyway.

The other piece of the knowledge base is the structure of the report. We found that everyone has to specify the date, then they always say the name of the exam, then they usually give a certain kind of diagnostic, and they always seem to end up with an impression at the end, and they all need a signature. That structure is really the guts of the knowledge base.

Two years ago, Kurzweil was describing KVW as a 10,000-word system. Why is it now called a 5,000-word system?
Technically speaking, it's a 5,000- to 10,000-word system. The reason we're now calling it 5,000 has to do with the applications we're working on. We've found that at 10,000 words, the response time fell off. It still works, but it didn't work as fast as we thought it had to work.

Without getting down to the details of an algorithm, when you say a word, it does a kind of comparison against everything you've said before. At 5,000 words, it provides what we consider a reasonable response time with reasonable accuracy.

How close is the industry to producing the dreamed-of executive information system: natural-language queries, a powerful data base and a voice interface?
The voice part is probably farther along than the other elements. I don't mean that as a cop-out, but we were working with AI Corp. to interface our system with theirs, and it really worked out just fine.

What tended to be the bigger issue was this: We've got this chief executive sitting there, saying, "OK, tell me what's happening in such and such a division," and the system would come back and say, "Information not found" or "Sorry, the link is down." It's only as good as the data base. There are a lot of things we could do with AI, and we've just scratched the surface. One is developing the knowledge base further — that whole process could benefit from AI-type tools.

Another is the recognition process. We've put in the first context-sensitive experts to help the system recognize words, but we're looking at making those more sophisticated. There's a lot of room for the AI tools to improve the accuracy and usability beyond what it is today. •

Need to rent or lease computer equipment?

Find what you're looking for with the *leased* amount of effort — in MARKETPLACE.

COMPUTERWORLD MARKETPLACE

Shop for the products and services you need. Every week.

The best thing next to an IBM PC. Or any PC.

Model 310/360

The economics of IBM ASCII displays.

The affordable Models 310 and 410, when equipped with cartridges, offer PC terminal function for all multi-user PCs. That includes the IBM® RT-PC™ computer and the IBM PS/2™ family.

What's more, Models 310 and 410 offer many popular emulations. Optional cartridges provide features such as concurrent DEC™ and PC connectivity, and auto dial. Both models come with a 3-year warranty. Add an IBM Maintenance Agreement, and you'll get five years of IBM service for just $54.

The ergonomics of IBM ASCII displays.

They're not only economically attractive, they're easy to look at. Flat 14" screens offer non-glare viewing. Green or amber/gold short-persistence phosphors produce crisp character resolution. And each model uses the advanced 102-key IBM keyboard.

Model 410/460

"Want more information? Just ASCII."

For a free brochure and to find a distributor near you, call 1-800-IBM-7257 ext. 89. Or call your IBM Marketing Representative.

IBM

IBM is a registered trademark and PS/2 and RT PC are trademarks, of IBM Corporation. DEC is a trademark of Digital Equipment Corporation. © IBM 1988

A simple barometer forecasts software trouble

Use this formula to preview how much trouble your new system will give you later on

BY MARK DUNCAN

Forgive the systems development professional who can't get excited about software maintenance. With looming corporate expectations to "get the job done" — and quickly — it's tough for maintenance considerations to really be anything more than just an afterthought.

And while computer-aided software engineering (CASE) automates more and more of the development life cycle, until CASE technology fully matures and is affordable to even modest-size data processing departments, MIS must find alternative ways of ensuring the quality of software during the development stage.

Which brings us back to square one and the systems developer. It should come as no shock to rational DP professionals that the best time to consider the maintainability of application software is during its development.

To address the future maintenance of their software, MIS managers must ask themselves three fundamental questions:

- Can I correct the software when it fails?
- Can I modify the software to reflect changing requirements and technology?
- Can I test the software fixes and software modifications?

One could proceed simply by using this checklist, but no single list can cover all applications development and maintenance situations.

Furthermore, repeated use of the same checklist does not lend to self-refinement. And while answers to questions on a checklist are meaningful individually, the checklist as a whole really does not guarantee that the application has been checked over thoroughly.

Checklists are designed to yield the "right" answers. Half-right or half-wrong checklists or any combination of "yeses" and "nos" in the same checklist are difficult to evaluate.

Complex application software requires something more sophisticated than a check mark on a checklist to attest to its maintainability. It requires actual measurement.

The traditional checklist must be transformed into a precise metric. The check marks and crosses on the list must be quantified into numeric values that are meaningful not only on an individual basis but provide summary data as well.

Available in some form

Checklists of some kind undoubtedly already exist in must MIS departments. With some creative customization and simple arithmetic, these can be converted into advantageous maintenance metrics.

Managers may then answer the question, "How maintainable is your software?" knowing that they can back up their answers with specifics.

In the same way that a checklist is made up of many questions, a metric consists of elements. Thanks to the work that has been done to date on software quality factors, two types of elements exist: binary and relative.

A binary element yields one of two answers to a particular question: yes or no. These answers may be quantified as 1 and 0, respectively.

The sum of these answers provides a measurement of an action or a deliverable. For example, say we were attempting to ensure the correctness of a piece of design documentation. A list of possible questions that constitutes the "correctness metric" might proceed as follows:

- Does the design agree with the requirements?
- Are all defined functions referenced?
- Are all conditions and processes defined for each decision point?

If the answer is yes to all three questions, then the metric value would be 3. Expressing this value as a ratio (the sum of the answers to the total number of questions) will always give an answer between 0 and 1. The above metric value would be a 3-to-3 or a perfect 1.

If there are one, two or three "no" answers, the metric value would be 0.67, 0.33 or 0, respectively.

The other type of element is a relative element, which is less subjective than a binary one. It measures the number of violations of a specific rule or coding standard.

For example, there may be a Cobol coding standard in your shop that says IF-statement nesting may not exceed three levels. The metric value for the IF-statement coding would, therefore, be the number of violations of the rule divided by the total number of IF statements in the module.

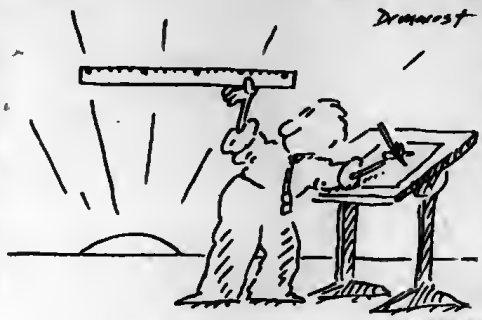
Then, to normalize the element, subtract the metric value from 1. This will always yield a value between 0 and 1.

Consistency

If there are several such measurements related to one aspect of the software, the metric value is their sum divided by the number of measurements, so the final value is still between 0 and 1 — consistent with binary metrics.

For example, in addition to the above IF-statement rule, your shop might have two other rules for standard coding: error-handling conventions and naming conventions.

The corresponding metric elements would be 1 minus the number of violations of error-handling convention, divided by the total number of error-handling instances in the module;



CHRIS DEMAREST

Duncan is a quality assurance consultant at a major Dallas bank.

- **A basic maintenance metric**
- **Ask: Can I correct and update this software?**
- **Measure how often coders break the rules**

© 1988 Hayes Microcomputer Products, Inc.

Some people have bought low-cost Hayes-compatible modems, expecting to get a Hayes modem.

Unfortunately, they disregarded the age-old notion that equates paying less with getting less.

And less is exactly what they got.

Modems that they discovered really weren't fully compatible with the Hayes 'AT' Command Set.

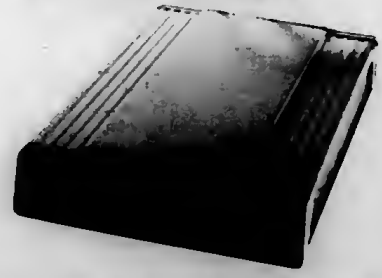
HAYES COMPATIBILITY AND OTHER MODEM MYTHS.

Modems that proved undependable on noisy phone lines.

Modems that didn't deliver the full functionality of software packages.

Modems whose technical support ranged from indifferent to incompetent.

It's no news that manufacturing shortcuts and diminished levels of customer service can lower prices. But at Hayes our efforts have always gone, and will always go, toward making modems that are better. Not cheaper.



For your nearest Hayes dealer, call **800-635-1225.** Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. **Hayes.**

How correctable is your software?

Write your own questionnaire like this one to determine the 'correctness metric' of your system

1. In all documentation current? ☐
2. Is documentation according to standards? ☐
3. If the software fails with a user abnormal ending, does the error message indicate the fix required? ☐
4. Are recovery and restart instructions documented? ☐
5. Is code self-documenting enough to facilitate correction? ☐

likewise with naming conventions.

If you calculated each of these three metrics to determine coding correctness for that piece of software, then an absence of violations would yield a metric value of 1 plus 1 plus 1 divided by 3 — or 1.

But suppose there were violations of each rule. If there were two IF-statement violations out of 10, one error-handling violation out of four and five procedure-naming violations out of 10, then the metric value would be 0.7 — less than 1.

Within any multiple-element metric, binary and relative elements may be mixed freely. Binary elements yield a value of 0 or 1; relative elements yield a value between 0 and 1.

Therefore, adding the elements of one or both types within a metric and expressing the result as a ratio of the total number of elements will always yield a value between 0 and 1.

This result quickly indicates how closely the actual metric value approaches any target value you may have set, with 0 typically representing the worst case and 1 the best.

Nothing stays the same

Metrics are useful in quantifying the maintainability of application software while it is still being developed. However, they are not static. They must continually be refined by examining the type of maintenance performed on the application software.

Trends and high frequencies of specific maintenance tasks may indicate that the metric is in need of modification. It may even signal the need for an entirely new metric to address the problem and provide error prevention.

For example, if programmers find that the most time-consuming part of retesting a program is locating or recreating the test data, then, obviously, the metrics addressing test planning, test data creation and test documentation need to be scrutinized and modified.

Metrics are simple to develop and may be customized to reflect any hardware and software environment. They may be applied to documentation, source code and test data and appear at the individual program module level or system level.

The number of elements in a given metric will vary, depending on the particular environment and the degree to which a particular deliverable is being measured.

Moreover, an element or an entire metric may be common to different aspects of the software. For example, "simplicity" is a software attribute that is desirable for both system maintainability and testability.

Consideration should be given to automating the selection and completion of maintenance metrics. A systems developer may then be able to identify the particular phase and attributes in which he is interested and, thus, be presented with the appropriate metrics to complete interactively.

Three basic principles

Keeping in mind the three fundamental elements of software maintainability — its ability to be corrected, modifiability and testability — you might construct your own metrics as follows:

- Ability to be corrected: Can the software be corrected when it fails? Elements of this metric should highlight the attributes of the software that facilitate the correction of errors with the appropriate speed and safety (see chart left).
- Modifiability: Can the software be modified when requirements change or when technological advances necessitate it?

Elements of this metric should address aspects of the software that enable system changes to be made easily and safely. For example, if the deliverable is source code for a program in IBM's IMS, metric elements might be similar to those shown (see chart above).

- Testability: Can software fixes and modifications be tested? Elements of this metric should emphasize attributes of the software that facilitate effective testing and retesting of the software.

Maintenance is an afterthought in most systems development situations. During development — time being of the essence — MIS's efforts focus on implementation dates and budgets. The difficulties of system maintenance are accepted as a fact of life, with little credence given to the idea that simple considerations during development might actually lessen or eliminate them.

But viable and effective maintenance metrics, applicable during software construction, must become part of the systems development process.

Far from being a threat to budgets and an impediment to speed, maintenance metrics can produce high-quality application software that yields high returns via low maintenance costs. •

How modifiable is your software?

A questionnaire like this one can help pinpoint how easy it will be to change or enhance your system

1. IMS call statements conform to standard format

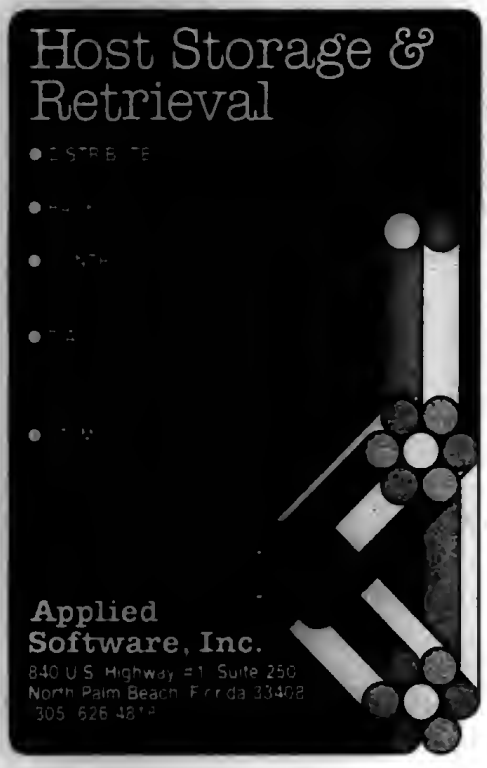
$$1 - \frac{\text{Number of nonstandard IMS call statements}}{\text{Total number of IMS call statements}}$$ ☐

2. IMS status codes checked in consistent fashion

$$1 - \frac{\text{Number of nonstandards status code checks}}{\text{Total number of status code checks}}$$ ☐

3. SSA construction is consistent

$$1 - \frac{\text{Number of nonstandard SSAs}}{\text{Total number of SSAs}}$$ ☐



Looking for computer training services?

MARKETPLACE puts you on the right track.

COMPUTERWORLD MARKETPLACE

Shop for the products and services you need. Every week.

MANAGEMENT

TAKING CHARGE

James Connolly

People hold systems key

The rewards are there for the managers and companies who come up with the next superstar strategic system in the tradition of AMR's Sabre and Baxter Health Care's ASAP.

There are promotions, awards and raises for the managers. There is the chance for corporate profitability. There is the opportunity for everyone to see their success written up in journals such as the *Harvard Business Review*. Reaping the benefits might be the easy part. The tough part is figuring out how to come up with that honored system.

A dozen leading MIS executives recently gathered at a *Business Week* conference in New York to share their thoughts on how to develop strategic systems and how to weigh the benefits and costs of such projects.

These executives offered a variety of suggestions and observations that may not fit together to form a model but, in a bit-by-bit manner, do provide an overview of the concerns their peers must address.

As varied as the suggestions were, most of the speakers raised a common theme centered on people.

Managers such as Darwin John, vice-president of information systems at Scott Paper,

Continued on page 86

Keeping up with CDC

VIM guides users in coping with changes

BY JEAN S. BOZMAN
CW STAFF

Control Data Corp. is shifting gears — moving toward open standards and a transparent architecture under the firm's NOS/VE operating system that links workstations and mainframes. For CDC users, the strategy means that they, too, must shift gears or be left behind with aging hardware and outdated software.

Being left behind is an uncomfortable prospect for the 350 sites represented by the VIM users group, which was founded two decades ago and named with the Roman numerals standing for then-current CDC 6000 mainframe.

Unlike larger users groups such as Common, Guide International Corp. and Share, Inc., which represent IBM users, VIM is relatively small and informal. Many users have been attending the meetings for 10 years or more and know other VIM users by their first names.

One reason users attend VIM, according to newly elected VIM Vice-President Bob Kirkman, a 12-year VIM veteran, is to give CDC executives direct feedback on products and user concerns. "I'm convinced that I've been able to change a few things," Kirkman said.

Despite the company's annual shareholders' meeting — held the same week — when the semiannual VIM gathering was held in Irvine, Calif., earlier this month, CDC executives flew in from Minneapolis to meet with prominent CDC shop managers for a one-day session on managing change.

"CDC feels their executives can talk to us fairly openly," said newly elected VIM President

Continued on page 88

Data View

Sharpening the edge

MIS wastes time and resources maintaining existing systems while not improving competitive advantage: Execs say so

*Some of 148 respondents from companies with sales of more than $1 billion

INFORMATION PROVIDED BY UNITED RESEARCH CO.
CW CHART

MIS chief walks point on decentralization

BY JAMES CONNOLLY
CW STAFF

GREENWICH, Conn. — Tom Gaughan has seen changes and overseen changes in his six years at Primerica Corp.

For instance, Primerica was called American Can Co. and drew 85% of its $4.8 billion in revenue from manufacturing when the ruggedly built, easy-smiling Thomas R. Gaughan joined the firm as vice-president of corporate information systems and services in 1982. He took over a centralized MIS operation with multiple IBM mainframes and 300 MIS employees in that shop.

Today, the cans and the rest of the manufacturing business are gone from Primerica, which has turned itself into a diversified services company focusing on financial and retail businesses. The centralized mainframe operation is gone, too, with the hardware and the day-to-day decision-making shifted out to operating units.

Trimming the staff

As a result, the former 300-employee central MIS group is down to 30 people. The headquarters staff is supported by a 200-node IBM Token-Ring personal computer network with gateways to host systems in subsidiaries for those times when mainframe applications are needed.

Gaughan was brought in to change the structure of the information systems group in order to keep it consistent with the structure of the evolving company. Today, his focus is to ensure that information systems maximizes its contribution to business objectives.

The easy smile fades when Gaughan talks about the staff cutbacks and transfers. "The toughest part of this job has to be reacting to changes that impact on people," he says.

He has had to tell people they must relocate and tell others that the projects they had devoted their time to were being shifted to spin-off companies — he had to talk to those people and rationalize the moves.

The Primerica MIS strategy is not one of gutting the systems group but one of decentralization and reaction to strategic reorientation of business.

"I think our change is one of the most dramatic in American industry in terms of changing the focus of the business as well as

Continued on page 87

PROFILE
Thomas R. Gaughan

Position: *Vice-president of corporate information systems and services, Primerica Corp.*
Mission: *To ensure that MIS maximizes its contribution to business objectives and structure the group to meet the needs of the evolving company.*

APC's Seaton honored for MIS leadership

BY JAMES CONNOLLY
CW STAFF

OAKLAND, Calif. — The chairman of a $1.2 billion shipping company that computerized its international cargo and container operations will be honored this week for exceptional leadership in managing information technology.

Bruce Seaton, chairman and chief executive officer of American President Companies Ltd. (APC) in Oakland, will receive the fourth annual Gartner Group, Inc. Excellence in Technology Award during ceremonies in Vienna, Va.

Seaton is being honored for driving APC's automation in an industry that the selectors noted had been lagging in technological innovation.

The key network and information system innovations cited by the awards committee include APC's Cargo and Container Management System (CCMS), which was designed to track customers' freight, APC's equipment and the paper and financial information associated with international cargo moves.

The company has used CCMS to reduce the amount of paperwork associated with shipping and has also developed one of the first computerized cargo clearance systems to expedite the preinspection and clearance of imports through the U.S. Customs Service.

One of the tools that is used with CCMS is APC's Computer-Aided Logistics Systems, which provides decision support that allows managers and logistics analysts to plot potential shipping routes, identify potential stress problems and plan the most efficient logistics possible for ship, rail and truck moves within the APC transportation network.

APC's Seaton

APC is also using electronic data interchange to provide customers with on-line access to the CCMS data base and is using financial systems to analyze the profit potential for any container move between two points on the globe.

Earlier winners of the Gartner Group award were AMR Corp. Chairman and CEO Robert L. Crandall, Federal Express Corp. Chairman and CEO Frederick W. Smith and Aetna Life & Casualty Co. Vice-Chairman William O. Bailey.

The award committee was composed of nine information systems executives, including APC Chief Information Officer James S. Marston.

CALENDAR

ADA 1988 National Operations and Automation Conference. Atlanta, May 23-25 — Contact: American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Electronic Shopping '88. Boston, May 22-25 — Contact: Touche Ross & Co., Suite 1900, Alcoa Building, One Maritime Plaza, San Francisco, Calif. 94111.

VIP '88. Dequesne Systems' International User Group Conference. New Orleans, May 23-25 — Contact: Mark Power, Dequesne Systems, Two Allegheny Center, Pittsburgh, Pa. 15212.

Expert Systems and Artificial Intelligence Symposium. Washington, D.C., May 23-25 — Contact: Digital Consulting, Inc., 6 Winter St., Andover, Mass. 01810.

Case Studies Ninth Annual Conference on Applications of Computer-Aided Software Engineering Tools. Ann Arbor, Mich., May 23-27 — Contact: Rebecca Sizemore, Meta Systems, Suite 200, 315 E. Eisenhower, Ann Arbor, Mich. 48108.

Contrasting Perspectives on Information Technology. Wellesley, Mass., May 24 — Contact: Center for Information Management Studies, Babson Park, Wellesley, Mass. 02157.

Ordernet Services' User Group Meeting. Columbus, Ohio, May 24-25 — Contact: Sterling Software, Ordernet Services Division, 1651 N.W. Professional Plaza, Columbus, Ohio 43220.

Testing for Conformance to Information Technology Standards. Gaithersburg, Md., May 24-25 — Contact: U.S. Department of Commerce, National Bureau of Standards (600), Gaithersburg, Md. 20899.

Aerospace and Defense Project/2 Group Conference. Newport Beach, Calif., May 24-26 — Contact: Rob Bloom, Project Software & Development, Inc., 20 University Road, Cambridge, Mass. 02138.

Mark Up '88, International Conference and Showcase on the Standard Generalized Markup Language. Ottawa, May 24-26 — Contact: Graphic Communications Association, Suite 604, 1730 N. Lynn St., Arlington, Va. 22209.

Computer Marketing Symposium. New York, May 25 — Contact: ACS Communications, Suite 306, 55 Northern Blvd., Great Neck, N.Y. 11021.

Electronic Data Interchange: Bringing It Together in Government. Gaithersburg, Md., May 26 — Contact: Dorothy Walsman, National Bureau of Standards, Room 3166, Building 225, Gaithersburg, Md. 20899.

Connolly

FROM PAGE 85

told how important it is to leverage human relationships and to find excellent leaders.

Michael J. McLaughlin, vice-president of information systems at New York Life Insurance, explained that a key system at his firm was developed when the company wanted to think of its customers as people, not as six million policy numbers.

The system let New York Life look at a customer as an individual holding a variety of policies, not as three numbers buying three different types of insurance.

People skills

Laurance T. Burden, vice-president of MIS at Firestone Tire & Rubber, noted that a computer is only one-fifth, or maybe one-twentieth of a strategic initiative. Much of the rest is people-related — how people do their jobs, how they adapt to change and how they interact. He added that people also need to see new deliverables from their systems every six months or they lose interest.

Pillsbury Vice-President for Information Management John M. Hammitt said systems designers who impose changes on their users need to avoid causing fear of change among users.

John H. Rogers, director of corporate information and technology at Bank of Boston, told of how his company formed cross-organizational committees to address information systems issues. A key to staffing those committees was bringing in 17 nontechnicians to work with the 27 technical experts.

Not everyone can implement strategic, ultrasuccessful systems. Sometimes the best a company can hope for is to come up with one that lets it stay competitive. But it was apparent that successful systems are developed with consideration for the human element.

Connolly is *Computerworld's* senior editor, management.

SEE THE LIGHT.

Yes, I'd like to find out how BASIS can solve my text information management problems.

Name _____ Title _____

(_____) _____
Telephone _____ Ext _____

Company _____

Address _____

City _____ State _____ Zip _____

Hardware _____ Operating System _____

Type of Business _____

CW

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 163 DUBLIN, OH

POSTAGE WILL BE PAID BY ADDRESSEE

Information Dimensions, Inc.
Attn: Mr. Steven H. Clark,
V. P., Marketing/Sales
655 Metro Place South
Dublin, OH 43017-1396

MIS chief

FROM PAGE 85

the centralization/decentralization issue," he says.

"We had to dramatically change the way information services were provided in the organization. Basically, we've changed from a centralized operation to where we provide — I hate to call it consulting — value-added support to our companies," he adds.

Those companies include the Smith Barney, Inc. brokerage; insurance companies; investment and asset management companies; a mortgage banker; direct-mail marketers, including Fingerhut Corp.; and retailers, including Musicland Group, Inc.

The man who hired Gaughan from Standard Brands, Inc., former American Can Vice-President and Chief Administrative Officer Jerry N. Mathis, recalls, "Tom turned out to be a terrific performer. He has fine interpersonal skills and is very user oriented, which is very important in the systems business.

"He reorganized the entire department and reduced staff, but at the same time he maintained high morale."

Gaughan's responsibilities have included providing transitional support to manufacturing groups as they were divested and evaluating the MIS operations of companies considered for acquisition. In at least one case, Gaughan's negative evaluation played a role in Primerica's decision to not acquire a company.

In his post as the top information executive at Primerica, Gaughan manages a group that sets direction for the subsidiary companies' MIS operations. That direction-setting includes doing research on leading-edge technology for individual business units and then ensuring that the other business groups benefit from that technology whenever possible.

Some of the technologies the group has researched are artificial intelligence and image processing. Gaughan also coordinates volume-purchase discounts, deals with vendors on national accounts and sets telecommunications strategies.

When in Rome . . .

In addition to managing the different technologies used at the company's various subsidiaries, Gaughan is responsible for managing different cultures. "One thing that became clear early on was that as we acquired companies, we acquired those different cultures," he notes.

He describes himself as "results oriented but also somewhat flexible" and stresses that one of his key objectives is to motivate his people. That means being driven by project management and looking for opportunities and challenges.

He has had to change his approach from that of hands-on operations. "There you plan and execute. Now I plan and facilitate," he says.

He says his transition from an operations person to a businessman came two jobs ago, when he was director of systems at Celanese Corp. It was then that he had to become aware of how an entire factory operated, not just the MIS organization. He says today's age of specialization may make it harder for younger people to make such a transition, because they focus so much more tightly on a single technology or application.

Background

Gaughan, 50, has been in the computer field for most of his career. Born in Pennsylvania and raised in New Jersey, he majored in engineering and business at Philadelphia's Drexel University, at which he received an MBA in 1962.

He did some computer programming while working in Drexel's cooperative education program. After graduation, he participated in General Electric Co.'s management training program, during which he spent much of his time working in systems and programming.

"I was interested in how information systems are used to support the business function. Another thing that interested me was the constant change in technology. And it has never stopped changing," he says of the magnet that drew him to computers.

THE DARK SIDE OF THE INFORMATION EXPLOSION.

Have you seen the symptoms in your own organization? Someone scurrying to track down a report for a roomful of impatient executives. Or the panic caused when an important study seems to disappear into thin air.

Today in the U.S., there are literally trillions of paper and electronic documents in existence. And millions more are added every day. Faced with such a staggering amount of text information, simply finding what's needed, when it's needed, can be a real accomplishment.

Consider for a moment the cost to your own organization. Imagine 5000 people (average salary $20,000*) spending half an hour each day searching for needed information. The total annual cost? An incredible $6.2 million!

This is the problem that large organizations and government agencies face today. And the problem steadily worsens.

Happily, a solution exists to the problem. Now.

It's called BASIS and it's defining a whole new field called Text Information Management Systems (TIMS). It goes light years beyond primitive methods of handling text information.

Now documents can be retrieved based on content. That's right, *content*. Even just a word or phrase. And it takes just seconds.

No DBMS or word processor can do that for you.

BASIS has already automated key areas such as records management, research reporting, litigation support, organizational libraries, policies and procedures, and product data for both corporations and government. In fact, BASIS is saving time and money at over 1000 installations worldwide.

If you'd like to see how much BASIS can save for you, return the attached reply card. It's postage paid.

BASIS®
Text Information Management System

© 1988 Information Dimensions, Inc., 655 Metro Place South, Dublin, Ohio 43017-1396, 1-800-DATA MGT (In Ohio, 614-761-7300 collect)
® BASIS is a registered trademark of Information Dimensions, Inc.
* Based on U.S. Department of Labor statistics. At this rate, BASIS would pay for itself in a remarkably short period of time.

CDC

FROM PAGE 85

Abraham S. Levine. "They feel we won't misuse the information if they tell us about their future product plans."

Many of the approximately 500 VIM members who met said they depend on CDC's Cyber systems for engineering simulations or seismic and structural analyses at dozens of national laboratories, corporations and universities.

Yet most signs point to a turnover in the installed base of approximately 1,300 Cyber mainframes worldwide. "If you've got a strategy to stay with Control Data products, then you've got to migrate to the new NOS/VE environment," said Levine, who is manager of Scientific Computing Center Software Systems at Rockwell International Corp. in Seal Beach, Calif.

The problem is that many VIM users, particularly those in the electric utility business, are comfortable running custom NOS applications on older Cyber 700 and 800 machines. "NOS is a very comfortable system," noted Kirkman, a senior consulting engineer at Combustion Engineering, Inc. "NOS performs very well because it's been optimized for years."

Moving to NOS/VE was one of the hottest issues discussed at the VIM meeting. NOS/VE gives users special features that optimize CDC's 64-bit Cyber architecture for higher performance and better connectivity. But conversion can take months or years.

CDC is aware of users' concerns and has just opened a user liaison office at its Minneapolis headquarters to advise users on NOS/VE migration, Levine said.

A sign of the times

One sign that things are changing at CDC is the company's support for AT&T's Unix System V on all of its systems.

Levine said he sees the advent of Unix as an opportunity for CDC and its users to gain access to off-the-shelf Unix software. "Unix is a mine field for the big players like IBM and DEC," he added. "But it's an opportunity for the smaller players like CDC. Users are now going to be able to make procurement decisions based purely on price/performance, and I think CDC will compete very nicely on that basis."

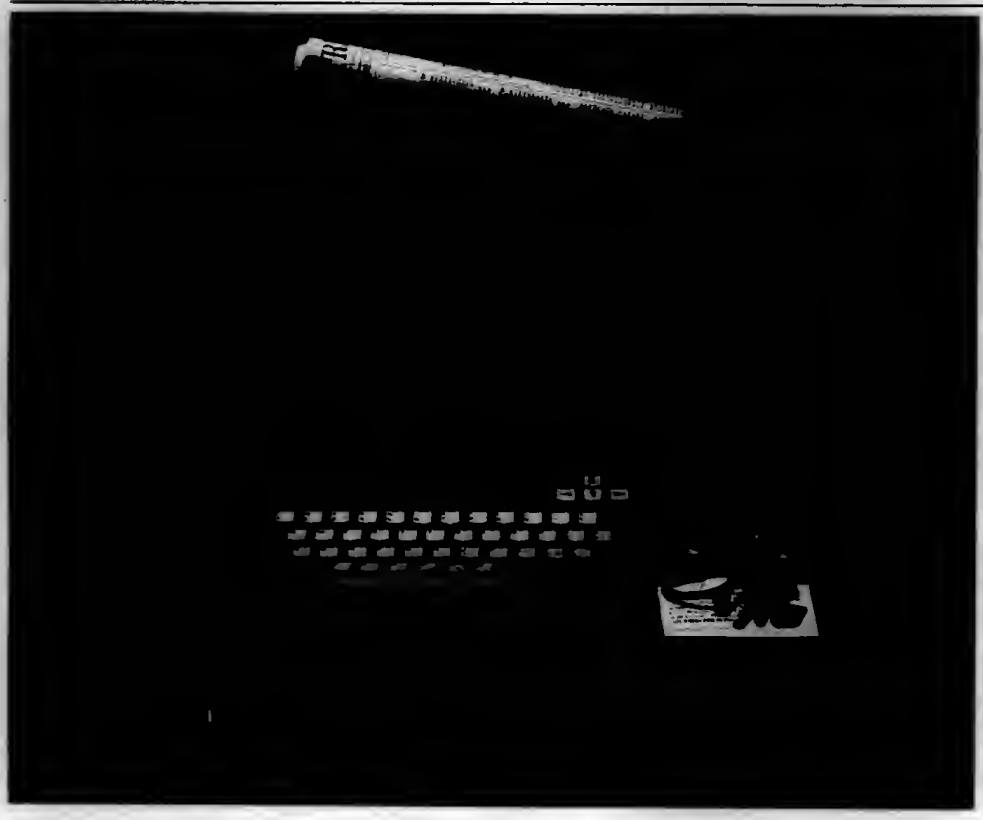
For an end-user group like Levine's Scientific Computing Center at Rockwell, Unix will make for greater compatibility between different vendors' systems. But at some companies, the advent of Unix on CDC machines may start a migration toward other vendors, users say. Large oil companies, for example, typically maintain machines from IBM and Digital Equipment Corp. as well as a supercomputer from CDC or Cray Research, Inc. for seismic analysis.

Although VIM membership has remained relatively steady in recent years, Levine and Kirkman said they are looking for new members. A likely source, they said, would be a site that "went out and bought DEC machines and came back when the users became dissatisfied with DEC service." But more users will be found among the dozens of new Cyber 900 sites abroad and the growing number of ETA Systems, Inc. supercomputer sites worldwide. ETA is a CDC subsidiary.

"Any CDC site can be a member of VIM," Levine explained. "We have some members from South America, Mexico, Israel — and even one site in the Soviet Union." But generally, European users join the European Control Data Organization of Users, and those in Australia and the Pacific Rim join the Austral-Asian CDC users group.

VIM's new board believes that CDC's revised management structure will play a role in growing the CDC user base.

"In some respects, the results of bringing on the new CDC management team have been immediate," Levine said. "The Cyber 930 program, for example, was floundering when new executives came on board 18 months ago. They told us last year that the 930 was going to come out on time, and they made it happen." The Cyber 930, financed by a special partnership, debuted in 1987 and new models were added this year.



TI's new TravelMate™ LT220. It's the closest thing to carrying a VAX™ in your briefcase.

Texas Instruments introduces the LT220 lap-top terminal — the next best thing to being there when you need remote access to your company's VAX.

The LT220 provides full VT220 emulation in a 4.8-lb. package, without sacrificing functionality. It features a 25-line screen that's easy to read. It even has a full-function keyboard like the one on a VT220.

The terminal communicates at 1,200 or 2,400 bps through one of its optional internal modems. For hard copy, just slide the LT220 into one of its optional cradles to add an ink-jet or thermal printer.

New credit-card-sized memory cards

let you create, update and store files. They're also handy for programming the LT220 to your specific application.

Like its Silent 700™ predecessors, the LT220 sets new standards for portability, durability and reliability. All of which makes it the perfect tool for anyone who's ever wished for a VAX in their briefcase. In short, this may be the best little terminal in the world.

So go ahead. Take the first step toward improving your productivity today. Call Texas Instruments for more information or to arrange a demonstration of the LT220. Phone toll-free, 1-800-527-3500.

TEXAS INSTRUMENTS

36154
© 1988 TI
Silent 700 and TravelMate are trademarks of Texas Instruments Incorporated.
VAX is a trademark of Digital Equipment Corporation.

We Could Write A Book On Networking Your Business. For A Small Fee, We Will.

No doubt, you've considered networking your PCs. How can you avoid it? That's all you read about these days.

But nobody's really telling you what it'll take to do it right.

Businessland* has a program that will do just that. It's called, "Expert! The LAN Planner."

For a fee of just $395,* a Businessland systems engineer will come to your office, talk about your business and go through your operation. Using the Businessland LAN planning workbook you have completed, he'll put together a detailed LAN plan that gives you all the information you need to make a sound networking decision.

Your plan will include all the specifics you need to connect your current equipment. Which hardware. Which software. How it should be connected. What it'll do for you. And should you decide you'd like Businessland to do it, the exact costs and time involved.

If planning a LAN is keeping you up nights, call 1-800-328-8383 for the Businessland Center nearest you. We'll give you some good reading.

BUSINESSLAND®

A Different Kind of Computer Company

*Includes LAN planning workbook and 3 hours of systems engineer time. Businessland and the Businessland logo are registered trademarks of Businessland Inc.

Will the computer decisions you make today prepare you for where you need to be tomorrow?

Success in business depends on anticipating the future.

It's just that simple.

And that's why NYNEX Business Centers sell personal computer systems flexible enough to meet your current as well as your future needs.

The answer is NYNEX.

NYNEX Business Centers offer competitive prices on a complete range of products from leading manufacturers, including IBM,® Apple® and COMPAQ®

We back the systems and software we sell with training, service and local support.

We offer complete financing alternatives including leasing.

For the NYNEX Business Center nearest you, call toll free:

1-800-346-9X9X

extension 4094

We offer the best equipment from the best manufacturers, including IBM, COMPAQ, and Apple. We sell systems which can accommodate growth through upgrades and add-ons. We also can network everything we sell and offer one of the best training programs in the business.

All at a price that's very competitive.

But most important, we know how to avoid quick fixes which may cheat you in the future. So why not contact your NYNEX Business Center representative for a longer term solution?

It could be the one decision you make today which puts you in charge of where you'll need to be tomorrow.

NYNEX Business Centers

Where business is headed.

IBM, COMPAQ, and Apple are registered trademarks of International Business Machines Corporation, COMPAQ Computer Corporation, and Apple Computer, Inc. respectively. NYNEX is a mark of NYNEX Corporation. © 1988 NYNEX Business Information Systems Co.

COMPUTER INDUSTRY

INDUSTRY INSIGHT

Clinton Wilder

Users lose in Unix war

It's my Unix, and you can't play with it. One of the most common one-liners peppering speech openings in the industry these days is, "The great thing about standards is that there are so many of them."

To the MIS professional trying to sort out compatibility issues for long-range planning, this is known as black humor. But if the current situation is an indication of the way vendors are going to behave, progress toward the goal of seamless interconnection among disparate systems may actually be moving backward.

Unix, which once seemed in danger of death by inattention, is now becoming the industry's most incendiary battleground. In the latest turf war, a faction that reportedly includes IBM, DEC, Hewlett-Packard and Apollo is planning to collaborate on a Unix version to counter the AT&T and Sun Microsystems alliance, which has enlisted the support of Unisys, Xerox, ICL and others. What is this? The Allied nations and the Axis powers preparing for World War II?

The phrase "rival industry standards" sounds like an oxymoron, but that is the logical outcome if the current trend runs its course. The inherent

Continued on page 100

Floating Point lays off 160

BY J. A. SAVAGE
CW STAFF

BEAVERTON, Ore. — Recent attempts to increase revenue by introducing products and cutting embryonic research and development projects have failed in the short term, so Floating Point Systems, Inc. decreased its costs last week by slashing 160 jobs, or 20% of its 800-person work force.

In a related announcement, the scientific computer vendor said it expects its second-quarter results will show a 10% decrease in revenue from the meager $19.2 million reported last quarter.

Floating Point has lost approximately $35 million in the last five quarters.

The layoffs were not concentrated in any particular area but ranged across the board, according to a spokesman from the company.

Howard Thrailkill, the company's president of just three months, is carrying the ax. A Floating Point spokesman would not say whether the layoff direction came from Thrailkill or from the company's board of directors.

Time to shape up

Jeffry Canin, an analyst at San Francisco-based Hambrecht & Quist, Inc., said Thrailkill had been "given a clear directive to get expenses in line."

Sources say Thrailkill has been ineffective in making his last four companies — including Four-Phase Systems, Inc., now Motorola Computer Systems — profitable.

The source also said Thrailkill has been involved with layoffs at the other companies at which he worked, although not at his own initiative.

"The problems at Floating Point are not specific to them," Canin said.

"There's increasing pressure in the array processor market. It's not exactly growing at a stellar pace."

Treading water

Canin said he expects to see the company's losses drop this year and expects it to break even in 1989.

Since the beginning of the year, Floating Point has introduced two major products: the Superserver minicomputer and five models of its M64 minisupercomputer.

Floating Point also announced it is abandoning R&D efforts on its FPS T series, a massively parallel supercomputer.

DEC takes aim at HP in Europe

PARIS — Digital Equipment Corp., concerned about mounting competitive pressure from Hewlett-Packard Co., has set up a European-level program targeting HP. DEC described the program in a secret internal publication, titled "Winning from HP," that was recently acquired by an IDG Communications, Inc. reporter.

DEC's European Competitive Analysis Team (ECAT) is the driving force behind the program. Located in Evry, France, ECAT is chartered to provide DEC country and area marketing units in Europe with analysis and strategic sales support data concerning HP, Honeywell Bull, Inc., NEC Corp. and Honeywell, Inc.

In the internal document, the DEC team described what it sees as HP's strengths and weaknesses, as well as the method by which DEC can take advantage of them. According to the report, HP is currently dissatisfied with its position in the industry. It is losing market opportunities as well as people; its reputation is waning and its growth stagnating, the ECAT analysts said.

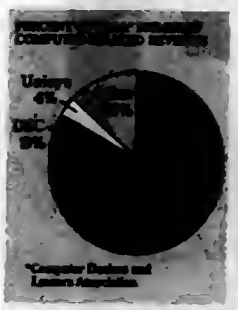
But HP now views itself as having weathered the worst and

Continued on page 92

Data View

Giant dominates leasing

IBM commands the computer leasing industry, with followers far behind



INFORMATION PROVIDED BY A 1988 GARTNER GROUP, INC./CDLA SURVEY
CW CHART

Nastec boss Sprinzen resigns

Leaves CASE vendor, returns to Relational fold

BY NELL MARGOLIS
CW STAFF

ALAMEDA, Calif. — When Martin Sprinzen arrives at his office this morning, he is bound to be hit with a sense of deja vu.

Relational's Sprinzen

The 39-year-old executive, who left his job as vice-president of technical services at Relational Technology, Inc. in September 1986 to become president of Nastec Corp., left Nastec recently, returning to Relational as vice-president of engineering and customer services.

At the time of his departure from Relational Technology, Sprinzen indicated to the press that his move was fueled by the challenge of pursuing a potentially exploding market. Precisely the same challenge motivates Sprinzen's return, he commented last week.

"Nastec has a real decent shot at the CASE market, which is up-and-coming," Sprinzen said, referring to computer-

Continued on page 96

Inside

- U.S. semiconductor industry hits four-year bookings high. Page 92.
- Industry mergers, acquisitions up 16% last year. Page 96.

Software 2000 hopes Silverlake runs deep

BY PETER BARTOLIK
CW STAFF

HYANNIS, Mass. — Its name hearkens to the advent of the next millennium, but executives at Software 2000, Inc. are confident they will find their riches by the dawn of the next decade.

Each new generation of IBM hardware has brought vast wealth and dominant market share to the handful of independent software firms savvy or lucky enough to be in the right place at the right time with the right product.

Executives at this small, Cape Cod-based company believe they have met the criteria for moving into that elite rank with the advent of IBM's long-awaited Silverlake line.

To hear company president Robert A. Pemberton tell it, Silverlake represents the golden age of computing: an opportunity to sell the logical third generation of applications software, borrowing the best attributes of mainframe and microcomputer applications and discarding the inconveniences of each.

If he is right, the firm stands to make a bundle selling software that is manufactured and packaged in the microcomputer shrink-wrap mold but with functionality more in line with the mainframe environment — at a price that straddles the two worlds.

But Software 2000 will have to plunge into Silverlake quickly, before the waters are full. Analysts say that any software developed for IBM's System/36 and 38 will have to be Silverlake or be unnoticed.

Hyannis's seaside atmosphere has helped 6-year-old Software 2000 retain all but two people in the headquarters and research and development staff in the past two years.

The firm was formed in 1982 with one purpose in mind: to capitalize on a new market represented by the introduction of the System/38.

"I looked at the operating

Continued on page 100

Up & Coming: *Software 2000*

Location: Hyannis, Mass.
Year founded: 1982
President: Robert A. Pemberton
Employees: 76
Product line: Business management software for the IBM System/38
Of note: Sales have reportedly doubled each year since 1984 to achieve $7 million in annual revenue; company sees major opportunity in converting applications to forthcoming IBM Silverlake.

DEC, HP

CONTINUED FROM PAGE 91

is engineering a comeback, according to DEC analysts, who compared this difficult period for HP with the one that DEC experienced before the first major VAX announcement in 1978.

HP's recovery strategies, according to ECAT, included the following:

- Emphasize peripherals business.
- Focus on commercial business with Unix.
- Emphasize indirect sales channels, such as value-added resellers and dealers.
- Be aggressive on price/performance issues.
- Maintain its current No. 1 position in customer satisfaction.

HP believes, according to DEC's team, that the market — especially in Europe — is standardizing on Unix, and it hopes to influence this move by having its entire sales force sell Unix.

The first results of this new strategy were apparent in early April with HP's announcement of nine systems that offered very strong price/performance. At the time of the announcement, HP officials made it clear that the products competed with similar offerings from DEC.

According to ECAT, HP is positioning itself as a technological innovator by designing a mainstream product — Spectrum — based on its reduced instruction set computing (RISC) precision architecture.

With its HP 1000 products, HP continues to be strong in the real-time marketplace, offering a low-end dedicated processing system for OEMs. DEC cited the scientific area, which HP is attacking with its high-end HP 9000, as a market in which its rival is demonstrating strength and aggressiveness — and often winning against DEC.

According to ECAT, HP's product weaknesses in the commercial environment are particularly significant in two areas. First, with the HP 250 being phased out, the firm has failed to provide a simple migration path for its user base, according to DEC. Second, the HP 3000 user base has stagnated and faces a difficult growth path, depending on the design of customer applications, according to ECAT.

INDUSTRY WEEK IN BRIEF

The U.S. semiconductor industry ended April with a bang by recording a four-year high in bookings, according to figures released by the Semiconductor Industry Association. Last month's $1.51 billion in bookings was the highest since May 1984, while the [illegible] million recorded in shipments last month represented a nearly 20% growth over year-earlier figures.

The book-to-bill ratio for the quarter also hit an 11-month high of 1.19, meaning that $119 worth of new chip orders came in for every $100 worth of chips shipped.

Once again, Jack has killed the giant. An appeals court in Cincinnati has ruled that Hewlett-Packard Co. must abide by a lower court's injunction ordering it to provide service calls to Hypoint Technology Co., a small computer maintenance firm in Cleveland.

For years, HP provided Hypoint with four-hour response time on service calls, enabling that firm to compete with HP. When HP cut off the service last August, Hypoint sued, charging monopolization and other anticompetitive practices [CW, Sept. 28, 1987]. In February, a federal judge issued an injunction preventing HP from denying the service to Hypoint.

VLSI Technology, Inc. has signed a long-term technology exchange with Hitachi Ltd. to provide its application-specific integrated circuit design technology for Hitachi to use in its semiconductor and integrated circuits work. In exchange, Hitachi will [illegible] CMOS technology available in San Jose, Calif.-based VLSI, the semiconductor [illegible].

Data Media Group, Inc. [illegible]

If You Could Input Anything Into Your Computer Instantly, Without Using The Keyboard, Would It Make Your Life Easier?

Introducing DeskScan 2000. The affordable scanner from Chinon.

Chinon's unique new scanner could change forever the way you use your computer. With OCR software, it scans, digitizes and inputs text into your computer so that you can edit it with almost any word processing software. That means no more retyping of documents. Just think how much time that could save you and your staff!

DeskScan 2000 also scans images, so that you can input graphics too. Then you can manipulate these images with desktop publishing or graphics software.

Best of all, DeskScan 2000 is much lower priced than most effective scanners. That means it's finally cost-effective to put a scanner on every PC user's desk.

DeskScan's unique overhead scanning design means that you no longer have to separate pages from documents to feed them through a scanner. The document stays still while the scanning head *"reads"* the page. And the unit automatically adjusts for room lighting levels.

Scanners aren't just for desktop publishing any more. DeskScan 2000 becomes an economical FAX, with the simple addition of an inexpensive add-in board. Chinon sells this exciting option and others in package combinations of bundled hardware and software — so that you have an affordable way of getting started with your scanner right away.

So see for yourself what DeskScan 2000 can do for you. Call TOLL-FREE 1-800-441-0222 TODAY for the DeskScan 2000 dealer nearest you.

CHINON

Chinon America, Inc., 660 Maple Ave., Torrance, CA 90503

MacintoshToday

Macintosh Today Qualified Subscription Card

Note: A free subscription to *Macintosh Today* will be sent to those applicants in the U.S. and Canada who qualify. The publisher reserves the right to limit the number of free subscriptions. Please answer all questions completely. Incomplete forms will not be processed. For questions requesting quantities, use specific numbers. Please sign and date this form.

Please accept my request for a free subscription to *Macintosh Today* ☐ Yes ☐ No

Signature _____

Title _____

☐ New Subscription Request ☐ Free Renewal ☐ Address Change (please provide old and new address)

Please provide your business address below or affix your business card.

NAME
TITLE
COMPANY/DIVISION
MAIL STOP — BUSINESS TELEPHONE
STREET
CITY/STATE/ZIP

Old Address: _____

SABX6

1. Industry (check only one)

Noncomputer-related businesses

☐ 1. Aerospace
☐ 2. Agriculture, mining, construction, oil
☐ 3. Business consulting (noncomputer-related)
☐ 4. College/university
☐ 5. Elementary/high school
☐ 6. Engineering/architecture
☐ 7. Finance, banking, accounting, insurance, real estate
☐ 8. Government
☐ 9. Health/medical services
☐ 10. Legal services
☐ 11. Manufacturing
☐ 12. Military
☐ 13. Other business services
☐ 14. Publishing/advertising/public relations
☐ 15. Research and development
☐ 16. Retail/wholesale
☐ 17. Transportation, communications, utilities
☐ 98. Other (specify) _____

Computer-related businesses

☐ 18. Computer consultant
☐ 19. Computer retail
☐ 20. Distributor/wholesaler
☐ 21. Manufacturer (computers, software, peripherals)
☐ 22. Service bureau
☐ 23. VAR/systems house/integrator
☐ 99. Other (specify) _____

2. Title (check only one)

☐ A. Chairman/president/owner/partner
☐ B. Vice president
☐ C. Controller/treasurer/accountant
☐ D. Director/supervisor/manager
☐ E. Project manager/chief/group leader
☐ F. Art director/writer/chief/group leader
☐ G. Engineer/scientist
☐ H. Administrator
☐ I. Consultant/advisor
☐ J. Microcomputer specialist/manager/analyst
☐ K. Programmer
☐ L. Educator
☐ M. Professional (lawyer, doctor, etc.)
☐ Z. Other (specify) _____

3. Department or function (check only one)

☐ A. Accounting/finance
☐ B. Administration/management/personnel
☐ C. Consulting
☐ D. Education/training
☐ E. Engineering/R&D
☐ F. Manufacturing/production
☐ G. Microcomputer center/office automation
☐ H. MIS/DP
☐ I. Purchasing
☐ J. Sales/marketing/distribution
☐ Z. Other (specify) _____

4a. Does your company own or lease any mainframe computers at this location?

☐ Yes (indicate quantity below) ☐ No

	Existing (quantity)	Plan to buy (quantity)
☐ 1. IBM		
☐ 99. Other (specify)		

4b. Does your company own or lease any mini-computers at this location?

☐ Yes (indicate quantity below) ☐ No

	Existing (quantity)	Plan to buy (quantity)
☐ 1. IBM		
☐ 2. DEC VAX		
☐ 3. Sun/Apollo		
☐ 99. Other (specify)		

5. Does your firm have or plan to buy any of the following types of personal computers or microcomputer systems at your location?

☐ Yes (indicate quantity below) ☐ No

	Currently own	Plan to buy within 1-12 mos.
1. Macintosh 128/512		
2. Macintosh Plus		
3. Macintosh SE		
4. Macintosh II		
5. IBM or compatible		
6. Sun/Apollo workstation		
99. Other (specify)		

6. Please indicate your involvement with each of the following types of personal computers or microcomputer systems (check all that apply)

	Macintosh	Software	Networks & Peripherals
A. Approve purchase	A. __	A. __	A. __
B. Develop/manufacture	B. __	B. __	B. __
C. Evaluate/select vendor	C. __	C. __	C. __
D. Own one	D. __	D. __	D. __
E. Own two or more	E. __	E. __	E. __
F. Purchase or acquire	F. __	F. __	F. __
G. Establish specifications	G. __	G. __	G. __
H. Recommend to others	H. __	H. __	H. __
I. Sell	I. __	I. __	I. __
J. Train people to use/ or provide support	J. __	J. __	J. __
K. Use	K. __	K. __	K. __
L. No involvement	L. __	L. __	L. __
Z. Other (specify by name and quantity)	Z. __	Z. __	Z. __

If you have no involvement with any of the above, skip to question 8.

7. Do you recommend, buy, specify or approve microcomputers, software, and/or peripherals?

☐ Yes ☐ No

If yes, please indicate for how many Macintosh personal computers you have this involvement. (check only one)

☐ A. 1-3 ☐ E. 50-99
☐ B. 4-9 ☐ F. 100-499
☐ C. 10-19 ☐ G. 500+
☐ D. 20-49 ☐ H. None of the above

8. How many people are employed by your entire company? (check only one)

☐ A. 1-9 ☐ D. 100-499 ☐ G. 2500-4999
☐ B. 10-24 ☐ E. 500-999 ☐ H. 5000-9999
☐ C. 25-99 ☐ F. 1000-2499 ☐ I. 10,000 or more

MacintoshToday

Macintosh Today Qualified Subscription Card

Note: A free subscription to *Macintosh Today* will be sent to those applicants in the U.S. and Canada who qualify. The publisher reserves the right to limit the number of free subscriptions. Please answer all questions completely. Incomplete forms will not be processed. For questions requesting quantities, use specific numbers. Please sign and date this form.

Please accept my request for a free subscription to *Macintosh Today* ☐ Yes ☐ No

Signature _____

Title _____

☐ New Subscription Request ☐ Free Renewal ☐ Address Change (please provide old and new address)

Please provide your business address below or affix your business card.

NAME
TITLE
COMPANY/DIVISION
MAIL STOP — BUSINESS TELEPHONE
STREET
CITY/STATE/ZIP

Old Address: _____

SABX6

1. Industry (check only one)

Noncomputer-related businesses

☐ 1. Aerospace
☐ 2. Agriculture, mining, construction, oil
☐ 3. Business consulting (noncomputer-related)
☐ 4. College/university
☐ 5. Elementary/high school
☐ 6. Engineering/architecture
☐ 7. Finance, banking, accounting, insurance, real estate
☐ 8. Government
☐ 9. Health/medical services
☐ 10. Legal services
☐ 11. Manufacturing
☐ 12. Military
☐ 13. Other business services
☐ 14. Publishing/advertising/public relations
☐ 15. Research and development
☐ 16. Retail/wholesale
☐ 17. Transportation, communications, utilities
☐ 98. Other (specify) _____

Computer-related businesses

☐ 18. Computer consultant
☐ 19. Computer retail
☐ 20. Distributor/wholesaler
☐ 21. Manufacturer (computers, software, peripherals)
☐ 22. Service bureau
☐ 23. VAR/systems house/integrator
☐ 99. Other (specify) _____

2. Title (check only one)

☐ A. Chairman/president/owner/partner
☐ B. Vice president
☐ C. Controller/treasurer/accountant
☐ D. Director/supervisor/manager
☐ E. Project manager/chief/group leader
☐ F. Art director/writer/chief/group leader
☐ G. Engineer/scientist
☐ H. Administrator
☐ I. Consultant/advisor
☐ J. Microcomputer specialist/manager/analyst
☐ K. Programmer
☐ L. Educator
☐ M. Professional (lawyer, doctor, etc.)
☐ Z. Other (specify) _____

3. Department or function (check only one)

☐ A. Accounting/finance
☐ B. Administration/management/personnel
☐ C. Consulting
☐ D. Education/training
☐ E. Engineering/R&D
☐ F. Manufacturing/production
☐ G. Microcomputer center/office automation
☐ H. MIS/DP
☐ I. Purchasing
☐ J. Sales/marketing/distribution
☐ Z. Other (specify) _____

4a. Does your company own or lease any mainframe computers at this location?

☐ Yes (indicate quantity below) ☐ No

	Existing (quantity)	Plan to buy (quantity)
☐ 1. IBM		
☐ 99. Other (specify)		

4b. Does your company own or lease any mini-computers at this location?

☐ Yes (indicate quantity below) ☐ No

	Existing (quantity)	Plan to buy (quantity)
☐ 1. IBM		
☐ 2. DEC VAX		
☐ 3. Sun/Apollo		
☐ 99. Other (specify)		

5. Does your firm have or plan to buy any of the following types of personal computers or microcomputer systems at your location?

☐ Yes (indicate quantity below) ☐ No

	Currently own	Plan to buy within 1-12 mos.
1. Macintosh 128/512		
2. Macintosh Plus		
3. Macintosh SE		
4. Macintosh II		
5. IBM or compatible		
6. Sun/Apollo workstation		
99. Other (specify)		

6. Please indicate your involvement with each of the following types of personal computers or microcomputer systems (check all that apply)

	Macintosh	Software	Networks & Peripherals
A. Approve purchase	A. __	A. __	A. __
B. Develop/manufacture	B. __	B. __	B. __
C. Evaluate/select vendor	C. __	C. __	C. __
D. Own one	D. __	D. __	D. __
E. Own two or more	E. __	E. __	E. __
F. Purchase or acquire	F. __	F. __	F. __
G. Establish specifications	G. __	G. __	G. __
H. Recommend to others	H. __	H. __	H. __
I. Sell	I. __	I. __	I. __
J. Train people to use/ or provide support	J. __	J. __	J. __
K. Use	K. __	K. __	K. __
L. No involvement	L. __	L. __	L. __
Z. Other (specify by name and quantity)	Z. __	Z. __	Z. __

If you have no involvement with any of the above, skip to question 8.

7. Do you recommend, buy, specify or approve microcomputers, software, and/or peripherals?

☐ Yes ☐ No

If yes, please indicate for how many Macintosh personal computers you have this involvement. (check only one)

☐ A. 1-3 ☐ E. 50-99
☐ B. 4-9 ☐ F. 100-499
☐ C. 10-19 ☐ G. 500+
☐ D. 20-49 ☐ H. None of the above

8. How many people are employed by your entire company? (check only one)

☐ A. 1-9 ☐ D. 100-499 ☐ G. 2500-4999
☐ B. 10-24 ☐ E. 500-999 ☐ H. 5000-9999
☐ C. 25-99 ☐ F. 1000-2499 ☐ I. 10,000 or more

MacintoshToday

15. Please list below any individuals at this location who also help to recommend, specify, acquire or approve the purchase of computer systems, peripherals, software or services to whom you would like us to send a complimentary subscription of Macintosh Today.

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Please fold, tape and mail.
PLEASE DO NOT STAPLE.

Fold ▼

Name _____

Company _____

Address _____

City/State/Zip _____

AFFIX
POSTAGE
HERE

MacintoshToday
Subscription Department
P.O. Box 5456
Pasadena, CA 91107-0456

MacintoshToday

15. Please list below any individuals at this location who also help to recommend, specify, acquire or approve the purchase of computer systems, peripherals, software or services to whom you would like us to send a complimentary subscription of Macintosh Today.

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Please fold, tape and mail.
PLEASE DO NOT STAPLE.

Fold ▼

Name _____

Company _____

Address _____

City/State/Zip _____

AFFIX
POSTAGE
HERE

MacintoshToday
Subscription Department
P.O. Box 5456
Pasadena, CA 91107-0456

Macintosh

has what you want. Timeliness. Side-by-side product comparisons. Trends and new technologies. Profiles of Macintosh users. Useful tips. Industry news and inside information.

When you read *Macintosh Today*, you know what's going on in the Mac marketplace. We have the most experienced editors ever assembled to produce a Macintosh publication. We know what we're writing about.

Macintosh Today was created *on* the Macintosh *for* the Macintosh. Its clear design and high quality make it easy to read for busy Macintosh users.

Best of all *Macintosh Today* is FREE to qualified volume Macintosh business and technical users. To qualify, fill out the qualification card and return it promptly.

If you wish to receive extra reader qualification cards, call 818.577.7233.

Best then.

Best now.

Send in your qualification card today!

3STATION. THE NETSTATION DESIGNED TO IMPROVE THE PERFECT NETWORK.

3Station's tiny footprint (14" x 14" x 3") means more space and less clutter on a user's desk.

Two years ago 3Com introduced the first network optimized server.

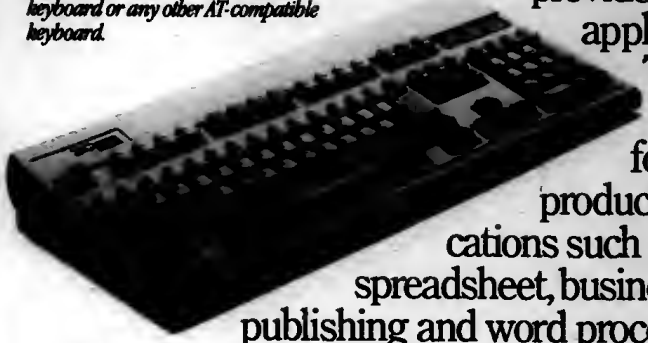
Today 3Com introduces the first network optimized workstation.

With 3Station we've significantly increased the performance and productivity of 3System by putting technology to work for you.

3Station is easy to use and offers better performance and reliability than using adapted PCs on your network.

And its high performance 80286 microprocessor and 1Mb main memory

© 3Com Corporation 1987. 3Com and 3Server are registered trademarks and 3Station and 3System are trademarks of 3Com Corporation.



Use 3Com's 101-key, AT-compatible keyboard or any other AT-compatible keyboard.

provide up to 35% more memory for your applications than adapted PCs.

This makes 3Station the optimized workstation for business productivity applications such as database, spreadsheet, business graphics, publishing and word processing.

3Station's built-in EGA graphics, Ethernet adapter, I/O and memory increase performance and make installation easy because there are no cards, jumpers or switches. You can install 3Station in minutes rather than the hours you need to adapt a PC.

You can use EGA, CGA or monochrome (including Hercules), monitors with 3Station.

3Station's single board design with no moving parts also provides more reliability than an adapted PC.

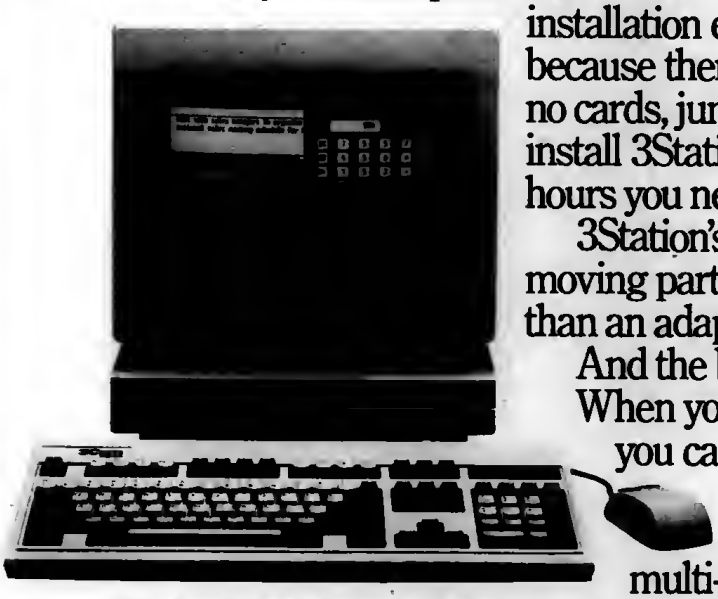
And the best news of all?

When you use 3Station in a 3System, you can realize significant cost savings, up to 50% per user, compared to adapted PCs or multi-user micros and minicomputers.

So with 3Station's price and performance, why use adapted PCs on your network?

When the future is 3Station.

For your nearest 3System dealer, or more information, call 1-800-NET-3Com.



3Station is ideal for memory-intensive applications.

PC MAGAZINE EDITOR'S CHOICE

3Com®
WORKGROUP SYSTEMS

Hercules is a registered trademark of Hercules Corporation. IBM PC/AT is a registered trademark of International Business Machines Corporation.

Mergers swell as valuations deflate

BY ALAN ALPER
CW STAFF

FORT LEE, N.J. — The number of acquisitions and mergers in all segments of the computer industry rose by 16% in 1987, according to a recent study by investment banking firm Broadview Associates.

Merger and acquisition activity also picked up in the first half of this year as market valuations of information technology companies remained well below the bloated levels of the past few years, said Broadview partner Harvey Poppel. Moreover, small, privately held companies that have been unable to float initial public offerings have instead sought to be acquired, he said.

"Based on informal statistics, we're running well ahead of last year," Poppel noted. "We see an increase of 25% to 30%." Broadview tracked a record 574 deals valued at nearly $10 billion in 1987. October's stock market crash slowed acquisition activity in the fourth quarter but did not have a material effect on the results, according to Poppel.

The study suggests that companies outside the industry were attracted to firms that could provide technology to enhance their traditional products and services, Poppel said. Companies in this category included Eastman Kodak Co., British Airways, Emhart Corp. and American Express Co.

Some hardware vendors acquired application software, development tools, proprietary data bases and marketing services firms to enhance their return on equity. Some 47 computer systems, publishing and telecommunications firms bought information services companies in 1987, the report stated.

Telecom draws big bucks

Telecommunications acquisitions dominated the largest computer-related deals in 1987

[illegible]	[illegible]	[illegible]
Alcatel	ITT unit	$1.3B
Memorex	Telex	$911
Computer Associates	Uccel	$830
Unisys	Timeplex	$350
Memotec Data	Teleglobe Canada	$325

INFORMATION PROVIDED BY BROADVIEW ASSOCIATES
CW CHART

A vast majority of sellers last year were information services and software companies. Computer and communications hardware companies accounted for 141 of the sellers, and telecommunications companies represented 46 of the sellers, the study said.

Telecom tallies high

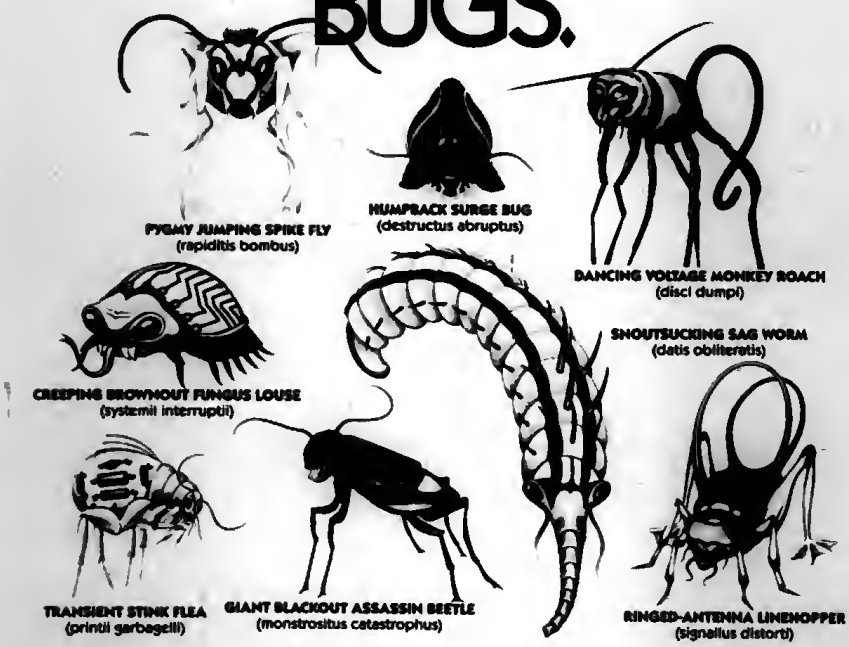
Eleven deals last year were valued at more than $200 million and involved a mix of telecommunications, hardware and computer services companies. Most of last year's large deals were telecommunications-related, Poppel said, led by Alcatel's $1.3 billion purchase of ITT Corp.'s telecommunications operations and Unisys Corp.'s $350 million acquisition of Timeplex, Inc.

Much of the activity this year continues to be in the communications industry — for instance, Tandem Computers, Inc.'s acquisition of Ungermann-Bass, Inc., Poppel said. Broadview said it expects more acquisitions in the communications arena this year and of systems integration firms and companies serving vertical markets such as financial services and computer-integrated manufacturing.

Another trend on the horizon is interest on the part of Asian companies, particularly those based in Japan, in acquiring U.S. information technology firms, according to Broadview.

"While there have been some alliances built, it now seems that there is general interest [in acquisitions] from Japanese firms with a penchant for technology," Poppel said.

KNOW YOUR BUGS.



If you've been having problems with your computer, chances are they are electric power related. Power problems can cause these eight computer pests. To get rid of them fast, call Onan.

Onan offers a complete line of equipment to eliminate these 8 pesky electrical problems. From high isolation transformers and line conditioners to standby battery power, uninterruptible power systems and generator sets, Onan is one of the leaders in solving power problems for today's computers.

For more information on power problems and how to solve them, call or write Onan or its local Distributor (see Generators in Yellow Pages) for a copy of Onan Technewsletter 10. A 17" x 22" poster of this ad is available upon request.

COMPUTER POWER BUGS, WE EAT 'EM ALIVE.

Onan

1400 73rd Ave. N.E. • Minneapolis, MN 55432
1-800-888-ONAN

Sprinzen

CONTINUED FROM PAGE 91

aided software engineering. "You can believe that I went through a lot of soul-searching before leaving."

Sprinzen said that Relational Technology, developer of the Ingres data base management system, approached him with "a very attractive opportunity. After hearing the details, there wasn't any way that I could say no," he said.

Although unable to comment on its nature, Sprinzen was emphatic in his belief that the company's strategy will succeed. "I have confidence and faith in Relational Technology," he said. "I've been there before."

While Sprinzen's new post is substantially similar to his old one, changes in the industry and growth at Relational Technology have expanded its scope. For starters, Sprinzen said, "I'll have more than twice as many people reporting to me."

The company's work force, as well as its revenue, has more than doubled between Sprinzen's exit and his return.

How to buy dBASE IV for $30.

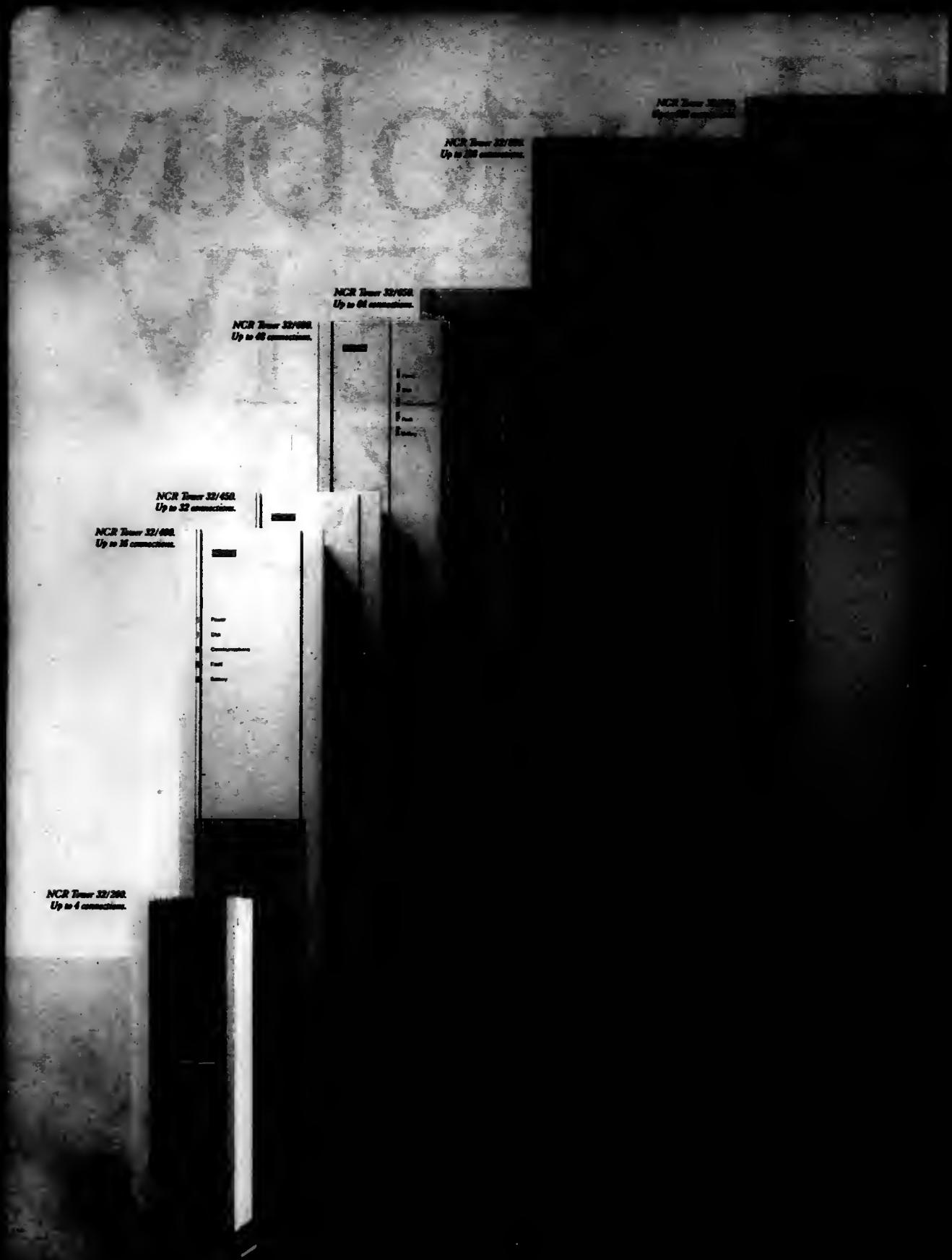
Buy dBASE III PLUS today.

Buy the best database program available today, dBASE III PLUS.™ Return the registration card to get your $30 upgrade certificate.* And you'll be one of the first to get dBASE IV™ this summer.

What about your dBASE III PLUS applications? Since dBASE IV is 100% compatible with dBASE III PLUS, everything you do now will work then. Only better. For more information or the name of the dealer nearest you, call 1-800-437-4329, extension 2292.

ASHTON·TATE®

*Upgrade offer valid February 17 through July 31, 1988. Proof of purchase required. Trademarks/owner: dBASE III PLUS, dBASE IV, Ashton-Tate/Ashton-Tate Corporation. © 1988 Ashton-Tate Corporation. All rights reserved.


NCR Tower 32/650.
Up to 64 connections.
NCR Tower 32/450.
Up to 32 connections.
NCR Tower 32/400.
Up to 16 connections.
NCR Tower 32/200.
Up to 4 connections.

POWER LINE.

Seven ways to tap the power of Tower.

The industry's biggest family of 32-bit UNIX™ supermicros is now bigger than ever. To give you more choice and more performance than ever.

For small businesses, there's the amazingly-compact, but powerful Tower 32/200. For very large applications, there's the Tower 32/850, with the power to support over 500 users. And five more Towers in between.

Extended family. Extended performance.

The Tower family is a family in the truest sense of the word. They're totally upward-compatible. To protect your software investment as you grow from Tower to Tower. And with more than 700 third-party programs now available in the NCR Software Catalog, there's plenty of software to help you grow.

If your applications are especially CPU-intensive, some of the newest members are designed specifically to help. With fast 25MHz CPUs and high-performance mass storage controllers that double I/O throughput.

An open door for future growth.

From the beginning, we've built the Tower family around industry standards. UNIX System V.™ Multibus.™ SCSI. All major communications protocols. Including DOS to UNIX links. Token-ring networks. SNA. X.25. 3270 Bisync. Ethernet/TCP/IP. And more. To keep your options open for whatever the future may bring.

Our commitment to open systems has made us a leader in the 32-bit UNIX market. It's a commitment backed by the service and staying power of a $5.6 billion corporation.

Phone (800) CALL NCR today. We'll show you how plugging into our power line can help your business grow to even greater heights.

NCR TOWER FAMILY.
[illegible] to Build On.

NCR

creating value

Software 2000

CONTINUED FROM PAGE 91

system of the System/38 and said it is not a minicomputer operating system," recalled Pemberton, a former MIS executive at State Street Bank & Trust Co. and Boston Safe Deposit and Trust Co. "I felt that if IBM could deliver on this promise, this is a future."

A privately held firm, Software 2000 claims to have doubled sales each year since 1984, achieving $7 million in revenue for its most recent fiscal year. That growth has been entirely generated by sales, Pemberton claimed, leaving the firm with no debt and no venture capitalists calling the shots.

What it has produced is a series of System/38 financial and human resource applications that work with its Domain 2000 application platform. Pemberton said the firm now has about 275 users, including its first customers, Diamond Shamrock R&M, Inc. and Shell Oil Co.

Software 2000's Pemberton

Accountants at Gilbane Building Co. in Providence, R.I., are using the General Ledger 2000 package. Steve Medeiros, manager of systems administration, said that although the company is currently working with System/36s, he will look at the Silverlake products when they are available.

"From our experience, Software 2000 would probably be one of the first places we would look for Silverlake software," he said.

Dave Schmiedicke, a systems analyst for the data processing department of the city of Santa Fe, N.M., concurred. The city is using Human Resources 2000, and Schmiedicke said the service and support from Software 2000 is excellent.

Although not ready to disclose pricing plans for Silverlake software, Pemberton said the firm will offer free conversion to existing customers in the first year.

According to Peter A. Morgan, vice-president of marketing, the company is planning for a minimum of 120 new customers with the advent of Silverlake. With the IBM line predicted to range in price from $800,000 at introduction to $1.8 million in 1990 for high-end configurations, "that opens up a software gap of $1 million," Morgan said.

Software 2000 sees IBM's apparent new-found respect for mid-range computing as a gold mine or perhaps, more aptly, a Silver mine. "There is a role reversal in the mid-range, where Digital Equipment Corp. has been dominant; suddenly, there is a need for a new [IBM] mid-range," Pemberton said. "We are in the right place at the right time."

Senior writer Alan J. Ryan contributed to this report.

Multiple Connections by Harris
No Matter How Remote
Your Branch Offices Are.

Way out there, your branch offices are struggling to cope with multiple communication lines, multiple communication protocols, and the need for networking PCs.

Harris has a solution that will never leave your remote offices out in the cold — the 9300 Network Communications System. The Harris 9300 provides branch offices with access to central data bases and IBM mainframe applications. It also enables PCs to utilize all the advantages of NETBIOS-compatible Local Area Networking.

The Harris 9300 supports the full range of communication protocols with IBM hosts for PCs and 3270 terminals, so there's no need to purchase separate communication gateways and controllers to provide IBM host connectivity.

Even when your mainframe and branch offices are poles apart, multiple connections by Harris can make them perform like they're home. Contact Harris when you need any combination of:

- 3270 host application or data-base access;
- Remote printing (RJE);
- PC connectivity.

Harris Corporation, Data Communications Division, 16001 Dallas Parkway, P.O. Box 809022, MS # 5, Dallas, Texas 75380-9022. Or call toll-free:

1-800-4-HARRIS
Ext. 5005

HARRIS

Wilder

CONTINUED FROM PAGE 91

conflict between competitive advantage in the marketplace and offering true connectivity with other vendors' products is rearing its ugly head. As usual, it's the users who are being ignored.

The MIS director of one Fortune 50 firm, interviewed recently by *Computerworld*, said his firm has steadfastly refused to jump on the Unix bandwagon until the dust settles. The company had joined the Corporation for Open Systems (COS) in the hope of seeing some progress on connectivity standards, only to become disillusioned when COS became, in his words, "much too vendor-driven."

Whether they realize it or not, the leading vendors are sending out a signal to their current and prospective customers that says, "Watch what we do, not what we say." It's easy for systems makers to pay lip service to supporting industry standards; it's a lot harder to make a business decision that might cede some of the advantages of a proprietary operating system to the competition.

The best thing about Unix was not supposed to be its functionality and certainly not its user-friendliness, but its ability to run on a wide range of systems, varying in both size and architecture. If the battle lines are drawn between two or more Unixes that can't talk to each other, what will have been accomplished?

Running scared. It's former CDC Chairman Bill Norris's worst nightmare — CDC as a rumored takeover candidate. Since the Belzberg family's 5% stake in CDC was revealed two weeks ago, Wall Street has been wondering if the Canadian investors will put the company into play.

Norris was the first and most vocal computer industry top executive to decry the takeover mania spawned in the bull market of the early 1980s, and CDC stockholders voted one of the first anti-takeover defenses. But the CDC defense has become fairly standard and is not considered a major deterrent if the fiscal stakes are high enough for the raider.

CDC certainly has more than its share of problems, and a case can be made that the company is still not run as efficiently as it could be. But a takeover and a piecemeal sale of CDC assets would be a tragedy for users. Just ask the customers of Datapoint.

Wilder is *Computerworld's* senior editor, computer industry.

...world?

...your own — You deserve it!

YES! I want my own subscription to COMPUTERWORLD. I'll pay just $44 for 51 weekly issues — that's only 86¢ per copy. In addition, I'll receive 12 FREE issues of COMPUTERWORLD FOCUS.

FIRST NAME | M.I. | LAST NAME

TITLE

COMPANY

ADDRESS

CITY | STATE | ZIP

Address shown: ☐ Home ☐ Business

For faster service call 1-800-255-6286! In NJ call 1-800-322-6286.

Canada, Central America & South America $110/Europe $165. All other countries $245 (Airmail)
Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. BUSINESS INDUSTRY (Circle one)
   10. Manufacturer (other than computer)
   20. Finance/Insurance/Real Estate
   30. Medicine/Law/Education
   40. Wholesale/Retail/Trade
   50. Business Service (except DP)
   60. Government — State/Federal/Local
   65. Communications Systems/Public Utilities/Transportation
   70. Mining/Construction/Petroleum/Refining/Agric
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
   90. Computer/Peripheral Dealer/Distributor/Retailer
   75. User Other _____
   95. Vendor Other _____
   (Please specify)
2. TITLE FUNCTION (Circle one)
   IS/MIS/DP MANAGEMENT
   19. Vice President, Asst. VP
   21. Dir., Mgr., Supvr., IS/MIS/DP Services
   22. Dir., Mgr., Supvr., of Operations, Planning, Adm. Services
   23. Dir., Mgr., Supvr., Analyst of Systems
   31. Dir., Mgr., Supvr., of Programming
   32. Programmer, Methods Analyst
   35. Dir., Mgr., Supvr., OA/WP
   39. Data Comm., Network, Systems Mgt.
   OTHER COMPANY MANAGEMENT
   11. President, Owner/Partner, General Mgr.
   12. Vice President/Asst. VP
   13. Treasurer, Controller, Financial Officer
   41. Engineering, Scientific, R&D, Tech. Mgr.
   51. Sales/Mktg. Mgt.
   OTHER PROFESSIONALS
   60. Consulting Mgr.
   70. Medical, Legal, Accounting Mgt.
   80. Educators, Journalists, Librarians, Students
   90. Others _____
   (Please specify)
3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   A. Mainframes/Supermins
   B. Minicomputers/Small Business Computers
   C. Microcomputers/Desktops
   D. Communications Systems
   E. Office Automation Systems
   F. No Computer Involvement

346820-2

...world?

...your own — You deserve it!

YES! I want my own subscription to COMPUTERWORLD. I'll pay just $44 for 51 weekly issues — that's only 86¢ per copy. In addition, I'll receive 12 FREE issues of COMPUTERWORLD FOCUS.

FIRST NAME | M.I. | LAST NAME

TITLE

COMPANY

ADDRESS

CITY | STATE | ZIP

Address shown: ☐ Home ☐ Business

For faster service call 1-800-255-6286! In NJ call 1-800-322-6286.

Canada, Central America & South America $110/Europe $165. All other countries $245 (Airmail)
Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. BUSINESS INDUSTRY (Circle one)
   10. Manufacturer (other than computer)
   20. Finance/Insurance/Real Estate
   30. Medicine/Law/Education
   40. Wholesale/Retail/Trade
   50. Business Service (except DP)
   60. Government — State/Federal/Local
   65. Communications Systems/Public Utilities/Transportation
   70. Mining/Construction/Petroleum/Refining/Agric
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
   90. Computer/Peripheral Dealer/Distributor/Retailer
   75. User Other _____
   95. Vendor Other _____
   (Please specify)
2. TITLE FUNCTION (Circle one)
   IS/MIS/DP MANAGEMENT
   19. Vice President, Asst. VP
   21. Dir., Mgr., Supvr., IS/MIS/DP Services
   22. Dir., Mgr., Supvr., of Operations, Planning, Adm. Services
   23. Dir., Mgr., Supvr., Analyst of Systems
   31. Dir., Mgr., Supvr., of Programming
   32. Programmer, Methods Analyst
   35. Dir., Mgr., Supvr., OA/WP
   39. Data Comm., Network, Systems Mgt.
   OTHER COMPANY MANAGEMENT
   11. President, Owner/Partner, General Mgr.
   12. Vice President/Asst. VP
   13. Treasurer, Controller, Financial Officer
   41. Engineering, Scientific, R&D, Tech. Mgr.
   51. Sales/Mktg. Mgt.
   OTHER PROFESSIONALS
   60. Consulting Mgr.
   70. Medical, Legal, Accounting Mgr.
   80. Educators, Journalists, Librarians, Students
   90. Others _____
   (Please specify)
3. COMPUTER INVOLVEMENT (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   A. Mainframes/Supermins
   B. Minicomputers/Small Business Computers
   C. Microcomputers/Desktops
   D. Communications Systems
   E. Office Automation Systems
   F. No Computer Involvement

346820-2

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO 55 NEPTUNE, NJ 07754

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPARTMENT
P.O. Box 1565
Neptune, NJ 07754-9916

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO 55 NEPTUNE, NJ 07754

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPARTMENT
P.O. Box 1565
Neptune, NJ 07754-9916

"I'm sorry, Mr. Littleton. But when they offered me my own subscription to Computerworld, I took the job."

Some people will go to any length for their own copy of COMPUTERWORLD.

Fortunately, you don't have to. You can get your own subscription delivered right to your desk every week. No routing slips. No waiting. No torn and dog-eared copy.

What you need to know.
When you need to know it.

You'll see what products breakthrough. And what products break down. You'll get the news and views of the industry. And the ads and advice of its leaders.

In fact, with COMPUTERWORLD on top of your desk, you'll be on top of your job.

And there's more...

In addition to your 51 issues of COMPUTERWORLD, you'll get — absolutely FREE...

12 issues of COMPUTERWORLD FOCUS — an in-depth exploration of a single critical topic each month: communications, data security, PCs, connectivity...

Our special Spotlight section. Head-to-head product comparisons with an at-a-glance ratings chart. Security products, LANs, graphics workstations ... a different product in each issue.

Call today. Or use the return envelope bound into this issue ... because your own subscription to COMPUTERWORLD is a perk you've earned.

1-800-255-6286

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTER CAREERS

Academia has its own allure

For some, university life-style and perquisites win out over top pay

BY BONNIE MACKEIL
CW STAFF

Although the educational field is known for some of the lowest salaries in the MIS world, it does offer some attractions for those willing to forego higher pay. Ease of entry and a speedier rise to positions of responsibility are attractive to recent graduates. More experienced data processing professionals are drawn by such offerings as teaching part-time, working with new technology, taking free or discounted classes and using school facilities.

For data processing professionals, opportunities are as readily available in education as in other fields, according to Steven Joffe, a vice-president at recruiting firm Source EDP in Paramus, N.J. "There are some universities doing active hiring; there are some universities having problems," Joffe says.

While schools often find their entry-level DP personnel among their own graduates, for more experienced professionals "there are opportunities there as the universities need more sophisticated systems," he says.

Mike Stack, systems programming manager at Northern Illinois University, sees a strong demand for qualified people.

Demand is particularly strong in technical support, he says; Northern Illinois has been unable to compete with private industry in hiring qualified candidates for that field. "There is a definite shortage of good technical support people, so most universities end up having to train them," Stack says.

Back to school

Phil Williams is an example of one who got his start in academia. As a captain coming out of the Marine Corps with no experience in DP, he found that most companies required at least two years of work experience.

After numerous interviews and rejections, Williams finally landed a job as an entry-level programmer at Georgia State University.

Williams, now manager of applications programming, sees many advantages to this move. "I was able to come in to the university with just classroom knowledge of coding," he says.

But unlike many others, Williams has not moved out of education. He says the benefits are worth staying for.

Attending classes at the same Georgia State facility where he worked made it easier for him to earn his master's degree in information systems. He also feels he can work with a more varied array of equipment than he would in many industry jobs. "Right now, we're running IBM, Amdahl Corp. and Sperry Corp. mainframes, which makes for a diverse environment," he says.

As a manager, Williams tries to be flexible about letting his people off during the day to attend classes. He asks only that they maintain a 40-hour work week by coming in early or working late to make up for lost time.

For Ronald Schonair, it is the stimulation of a university environment that makes a career in academic DP satisfying. He initially took a job as a computer operator at the University of Florida to earn money so he could resume studies for a master's degree. But Schonair never went back to school and is now the director of the university's Northeast Regional Data Center.

"The satisfaction of working on a university campus and being around bright, young minds helps me keep a fresh perspective," Schonair says. "The environment, with its culture and sports, eliminates the feeling that I'm working in the same pressure-cooker environment as many of my friends in private industry."

Chuck Kensicki, a project manager for Business Management Systems at California State University, entered academic DP for different reasons.

"My master's was hurting because I wasn't pursuing it fast enough. The company I was working for at the time wasn't ge ed toward my educational endeavors as they were toward their own work requirements," Kensicki says.

In private industry, he found restrictive guidelines for educational reimbursements, such as required grade-point averages and restrictions on fields of study.

Meet the challenge

However, DP at an educational institution is just as stiff a challenge as it is in private industry, says Kensicki, who has worked at California State for nine years and occasionally teaches courses there.

With such teaching responsibilities, DP professionals need to keep abreast of new technology in order to train students to go into the business world, Kensicki says. "In private industry, you can wait until the trend has been established and follow suit, vs. having to be a trend setter in the education field," he says.

But Kensicki agrees that there are a few other side benefits to alleviate some of these demands. "We have access to all the university facilities: eating facilities, gymnasiums, entertainment . . . all types of facilities your normal company wouldn't have. If you look at the cost of all that stuff, it begins to add up," he says.

MacKeil is a *Computerworld* researcher.

Academic earnings

MIS salaries in education are considerably lower than average MIS salaries industrywide

INFORMATION PROVIDED BY A *COMPUTERWORLD* / DATA PROCESSING MANAGEMENT ASSOCIATION 1987 SALARY SURVEY
CW CHART

PRIME

SYSTEMS & OPERATIONS SUPERVISOR

Saudi Arabia - Saudi Iron & Steel Co. (Hadeed)

$42,500 - 50,000 TAX FREE

Two-year renewable contracts

Hadeed offers an excellent employment package including free accommodation with family status, return flights for holidays, car loan scheme, six weeks' holiday, assistance with schooling, etc. All in a pleasant Gulf coast location.

Hadeed is the largest steel producer in the Kingdom of Saudi Arabia with over 2,000 employees.

The Systems and Operations Supervisor will have full responsibility for directing and co-ordinating the functions of the systems operations support group in the operation of the present triple PRIME 850 CPU complex and the 100+ attached and stand-alone microcomputers.

He will have further responsibility for planning future enhancements and upgrades and supervising their implementation by the group which currently consists of a systems programmer, systems administrator and seven computer operators working on a 24-hour shift system.

Close co-operation with the systems development and hardware maintenance groups will be required.

Candidates should have a degree or equivalent with a minimum of eight years' practical experience of which at least four should have been in a supervisory position.

Please write enclosing your CV to Ian Murray West, quoting Ref. 5304.

DALROTH & PARTNERS LTD., 12 GLOUCESTER PLACE, LONDON W1H 3AW, ENGLAND

HELP CREATE A MAJOR NEW MVS SYSTEMS SOFTWARE VENDOR

MVS Software, Inc., an investor-backed IBM mainframe systems software startup company, has the hottest product in the hottest new area in systems software "Lights Out" (unattended) datacenter operation Our product, Operations Productivity System/Multiple Virtual Storages (OPS/MVS), has been hailed as a "breakthrough product" by the Gartner Group and as the top product in the field by other industry opinion leaders. Now that we have the product we need the technical people who will help us sell it, support it, and extend it.

Senior Software Developers

Design, program, and test new OPS/MVS functions and extend existing ones You must have a deep understanding of MVS/XA and real talent for writing large programs in assembler language Prior IBM mainframe systems software development experience in a vendor environment is strongly desired.

Senior Technical Support Analysts

Solve problems for our existing customers and answer questions for our prospective customers. You must have an in-depth knowledge of MVS/XA and/or one of its major subsystems such as IMS/DC or CICS. You must like working with people over the phone and be able to travel occasionally

Senior Methodology Analysts

Work alongside our customers to revolutionize the way large MVS/XA datacenters are run You must have a strong MVS IMS/DC, or CICS systems programming background with a real feel for what actually goes on in a datacenter You must be able to travel 50% to 75% in the early years.

WORK FOR MORE THAN A SALARY

Even though we have been in existence for over 2-1/2 years, we are still a startup company with all the challenges and potential rewards (and risks) that implies All positions offer the chance for substantial capital gains from MVSI stock and the opportunity to receive substantial bonuses based on your own performance and MVSI's overall performance We also offer the opportunity to work with some of the best people in the industry to find better ways of developing and supporting world-class software

MVSI is currently Houston-based but we will be relocating to Los Angeles shortly Relocation assistance will be available. To respond send us something about yourself (handwritten OK) to

MVS Software, Inc. 6494 Stoney Drive Suite 101 Houston, Texas 77035

Or call our Recruiting Hotline and leave a detailed message: 713-975-4000

Analysts

Smith Kline & French Laboratories, an international leader in the health care industry located near Valley Forge, PA, offers excellent career opportunities for telecommunications professionals.

Data Communications Analyst

This hardware-oriented position involves both the planning and operational support of the SK&F R&D Worldwide data communications networks. Responsibilities include extending/maintaining the broadband and Ethernet local area networks supporting over 2000 devices in a new State-of-the-Art facility; management of Decnet, Wangnet, packet-switched and other facilities. Hardware experience must include Vax communication systems, Ethernet terminal servers, twisted pair wiring, multiplexers, broadband components and associated monitoring systems. A BS in Electrical Engineering or Computer Science is required for this position.

Telecommunications Analyst

SK&F R&D has an immediate opening for a telecommunications analyst with 2 to 4 years telephony experience. Responsibilities include the operation of a PBX terminal to process, move and change orders, maintain databases containing billing, equipment, and cable inventories. Responsible for analyzing trouble reports and effecting repairs. Ideal candidate will have demonstrated ability working with large PBX systems in a multi-vendor environment. A BA/BS in Computer Science or equivalent is required for this position. Experience working with Rolm PBX equipment is preferred.

Senior Operations Analyst

Responsibilities involve systems management as well as performance monitoring and tuning for a VAX8978 and distributed processors. A B.S. with extensive academic exposure to computer hardware and software technologies or equivalent experience is required. A minimum 2 years in support or development of system level software with knowledge of VAX/VMS, WANG and database technologies is also required. This position is a rotating shift position.

We offer a technologically advanced environment, excellent compensation and benefit programs and substantial opportunity for personal and professional growth. Promptly submit resume with salary requirements to: Barbara J. Schwartz, Associate Employment Administrator, S0049, SK&F Laboratories, P.O. Box 1539, King of Prussia, PA 19406-0939. We are an equal opportunity employer. M/F/H/V. NO PHONE CALLS PLEASE.

SK&F

[redacted]

Now staffing for long term growth. One person at a time.

We take a thoughtful approach to growth. That's why we experienced our 18th consecutive year of increased revenues in 1987, and feel confident we are well-positioned for 1988.

The Computer Services Division is a special group within American Management Systems, one of the nation's largest independent computer systems and services firms. We are best known for applying information systems technology to the complex management problems facing America's largest corporations as well as state and local governments. The eighteen year old Company employs more than two thousand four hundred at its Arlington, Virginia headquarters, and offices in major cities across the U.S. Currently, we have openings in the following cities: **BOSTON, HARTFORD, NEW YORK, and WASHINGTON, D.C.**

The Computer Services Division is small enough to assure a comfortable span of control for all. It will continue to be populated by the very best talent we can find – individuals who are at their best in a world-class consulting environment.

The arena is commercial and the end users are companies with large, complex information problems who must depend heavily on computer technology for effective management of their businesses. They include companies in the fields of financial services, education, insurance, telecommunications, manufacturing and non-profit organizations.

Your best work will be supported by the ready availability of colleagues with a wide range of expertise, the finest software productivity tools, an impressive library of proprietary applications software, and a life-cycle approach to the needs of our clients.

If you are comfortable in a highly professional work climate and intrigued with the idea of joining a great bunch of people working at the top of their profession, we warmly welcome your inquiry.

We have openings for experienced professionals in these specialized areas:

DEVELOPMENT MANAGERS: Strong technical management skills with 5-8 years' experience, preferably in product development. Previous experience with COBOL-CICS-VSAM-DBMS's in a large IBM environment.

BUSINESS MANAGERS: Strong background in managing operations, budgets and staffing strategies.

JUNIOR PROGRAMMERS: 2 years' experience in an IBM environment with COBOL, MVS, CICS, VSAM and IDMS.

SENIOR PROGRAMMERS: Strong background in IBM-MVS-JCL-COBOL with knowledge of structured programming. 3-5 years' experience required. Positions available for people with database experience, particularly ADABAS, IDMS, DB-2, and ORACLE.

PROGRAMMER ANALYSTS: 2-4 years' experience in any of the following areas: COBOL, JCL, CICS, IDMS, CSP, IMS-DB/DC, ADABAS, TSO and structured design techniques in an IBM environment.

TECHNICAL SUPPORT SPECIALISTS: To provide capacity planning and performance tuning in an MVS environment.

BUSINESS ANALYSTS: To provide front end analysis and support with clients and participate in requirements definition, general design, systems testing and quality assurance.

For immediate consideration, please send your résumé and salary history to: Ivan Yopp, American Management Systems, Inc., Computer Services Division, 1777 North Kent Street, Dept. CW-516, Arlington, VA 22209. An Equal Opportunity Employer.

AMS

AMERICAN MANAGEMENT SYSTEMS, INC.

Data Processing

DSMI DIAMOND-STAR MOTORS

NEW PLANT
NEW CAR
NEW CAREER POTENTIAL

Get involved with innovative breakthroughs of both America and Japan. This Mitsubishi-Chrysler joint venture is staffing its new, 2 million sq. ft. plant in Bloomington-Normal, Illinois. We will be the most technologically advanced automobile manufacturing facility in the world with over 400 robots. Our computer center consists of two IBM 4381-14 host computers and two Mitsubishi Electric Computers for assembly line control.

SYSTEMS ENGINEERS

The candidate should have experience with large on-line manufacturing business applications, IBM mainframes (300 family or larger) COBOL experience required. Experience with on-line data base applications, software package installation and support a plus.

Positions require a Bachelors Degree plus a minimum of 3-5 years IMS experience. Send resume with salary history to:

Recruitment and Placement SE
Diamond-Star Motors Corporation
100 N. Diamond-Star Parkway
Normal, IL 61761
No Phone Calls Please
AN EQUAL OPPORTUNITY EMPLOYER

Computer

SYSTEM ANALYST/ TECHNICAL PLANNER

System Analyst with computer software and math background needed to monitor and optimize data processing; monitor and optimize network performance; evaluate business forecasts to determine impact on data processing and/or network components; evaluate proposed data processing and/or network changes to assure service quality standards are maintained; and assist with the development of models and methods for producing and forecasting systems and/or network performance based on business requirements. Applicant must be able to anticipate and react to technical, organizational and structural variables as they pertain to group effectiveness, must be able to interact with information services management and related business functions in achievement of business objectives, and must be capable of formulating strategies to implement/achieving department objectives.

Applicant must have masters degree in computer science, M.S. [illegible] MVS. Salary to $34,500 annually. Job #[illegible]. Send resume to Job Service of South Dakota, P.O. Box 778, Sioux Falls, SD 57104, attention: Mr. Jim Waring.

Follow the leader, to Florida.

We're Software Services of Florida, providing data processing consulting services to major corporations and small companies. Our employees receive excellent benefits and salary commensurate with experience, as well as paid relocation. We are currently seeking highly professional consultants meeting the following qualifications.

- COBOL, CICS (IMS A PLUS)
- PL-1, IMS
- COBOL, IDMS, ADS/O
- FOCUS, VM/CMS
- C, UNIX
- RPG II or RPG III
- COBOL, DMS, TIP (UNIVAC HARDWARE)
- COBOL, on IBM S/36
- MODEL-204 with COBOL or PL-1
- AT&T 3B SYSTEMS ADMINISTRATOR
- COBOL, UCCEL PACKAGE EXPERIENCE
- DB-2, SQL

SOFTWARE SERVICES OF FLORIDA INC.

Call toll-free National: 1-800-237-8181 Florida only: 1-800-282-4141

or send resume to: Cy Dougherty, Personnel Director
Paragon Crossing, Suite 124, 11200 4th St. N., St. Petersburg, FL 33716

"Simply put, Computerworld delivers just what we're looking for: top-quality job applicants."

Roger Fraumann
Staff Director
Lachman Associates, Inc.
Westmont, IL

Roger Fraumann is Staff Director for Lachman Associates, Inc. (LAI) of Westmont, Illinois. It is one of the largest privately held computer systems software consulting and development firms in the United States. And Roger is pleased to report that plans call for continuing the 50% annual growth every year for the next five years.

Roger is also pleased with Computerworld's contributions to the company's growth. When he needs qualified people to fill positions as the company grows, he turns to Computerworld.

"Computerworld is the only national publication that we routinely advertise in," says Roger. *"Last year we determined that we needed consistent national exposure. We chose Computerworld, which gave us exactly that. Simply put, Computerworld delivers just what we're looking for: top-quality job applicants."*

"We get about 20 responses per ad, and what really counts is that those responses yield at least two quality applicants per ad," Roger explains. *"Overall, a higher percentage of quality people respond to our ads in Computerworld, as opposed to what other publications deliver. Computerworld works for us."*

Plus, Roger has found added incentive to advertise in Computerworld: *"The same ad that runs nationally in Computerworld costs twice as much to run in the Chicago Tribune, a local newspaper,"* he notes.

Since LAI began advertising in Computerworld, the company has gone from 50 to 130 full-time professionals. *"We've been in Computerworld about every other week. And with the company's plans for growth for the next five years, we're going to continue advertising in Computerworld,"* says Roger.

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Roger.

For all the facts on how Computerworld can put you in touch with qualified personnel, call your local Computerworld Recruitment Advertising sales representative.

COMPUTERWORLD

Sales Offices:
BOSTON: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700
NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350
WASHINGTON: 3022 Javier Road, Suite 210, Fairfax, VA 22031, (703) 573-4115
CHICAGO: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433
LOS ANGELES: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164
SAN FRANCISCO: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164

An IDG Communications Publication

Data Processing

Whirlpool CORPORATION

Whirlpool . . . a household name, is one of the nation's leading appliance manufacturers.

HIGH TECHNOLOGY HITS HOME

We are a company that makes your world a little easier - and your professional future more challenging and rewarding

The following positions are available in our Corporate Center located in southwestern Michigan

DATABASE ADMINISTRATOR

To design, implement, and maintain databases. Strong interpersonal skills and comprehensive knowledge of IDMS database systems and will work with data administrators and systems analysts to define application structures. Experience with manufacturing systems, TOTAL database systems and prototyping an asset.

SYSTEMS ANALYST

Provides support for Corporate Accounting, Marketing and Distribution Systems, including design, development, and implementation of information systems. Well-developed COBOL skills a must; experience in IDMS and ADS/O preferred. Strong analytical, written and verbal abilities essential. B.S. in Computer Science preferred. Business degree also considered. Related experience a must.

TECHNICAL ANALYST

Responsibilities primarily involve implementing and supporting on-line software, including CICS, GDDM, MULTISESS, DISOSS, INQUIRE, and others. Will also design, develop and implement software/technical programs; maintain existing support programs; monitor performance of on-line systems (IDMS) and provide consultation and support to users and application developers. Should know BAL, COBOL and CICS internals and have CICS experience. Must have good oral and written communication skills and a degree in Computer Science or equivalent.

In addition to a challenging, progressive professional environment that fosters your growth and achievements, Whirlpool offers competitive salaries and benefits. For confidential consideration, please forward your resume, complete with salary history and expectations to: WHIRLPOOL CORPORATION, 2000 M-63, Benton Harbor, Michigan 49022. Attn: Pauline Millard, Human Resources Dept. NO PHONE CALLS WILL BE ACCEPTED! An Equal Opportunity Employer M/F

SENIOR PROGRAMMER

Business Men's Assurance has an immediate opening for an experienced programmer. Individual selected will write, test, document and implement mainframe application programs, and research and resolve problems that develop. Qualified candidates will have a college degree and 2-3 years programming experience on mainframe systems. Individual will possess a demonstrated knowledge of COBOL and JCL. IDEAL experience is a plus. Strong interpersonal communication skills a must. BMA offers a competitive starting salary, excellent employee benefits, limited relocation package and a pleasant working environment. For prompt, confidential consideration, please send resume including salary history and requirements to: Lori Donnelly, Human Resources - 1015, BMA, P.O. Box 419458, Kansas City, Mo. 64141

BMA

Equal Opportunity Employer M-F H/V

Payless Cashways Inc.

Payless Cashways, Inc. Is Building A First-Class Data Center In Kansas City, Missouri

WITH OVER 40 MAJOR TECHNICAL PROJECTS IN THE MAKING!

Got any good ideas? If so, we can offer you the opportunity of a lifetime to put your thoughts into action and benefit from the results. Payless Cashways, Inc. is one of the 50 largest retailers in the nation, with a network of over 195 full-line building materials stores serving the home improvement market.

These newly created positions are located at Corporate Headquarters in Kansas City, Missouri. Our home base is a thriving midwestern metropolis with a fair share of cultural, educational and recreational attractions, beautiful park-lined boulevards, plentiful housing options and the pleasures of a 4-season climate.

Technical Service Manager

Our choice will be a visionary architect who thinks in long-range terms, knows how to get there and how to communicate their plans to decision-making management. This technical leader will be involved in networking, computer configurations and DASD Management capacity planning for a total mix of systems software and multi-location mini-computers and mainframes. Compensation for this position includes Bonus eligibility.

Minimum B.S. degree in Computer Science is required, preferably with a Master's in Computer Science. Minimum 8 years of hands-on experience is also required in MVS/SP, MVS/XA and other systems including VTAM, NCP, JES2 and CICS. Strong interpersonal skills, capacity and budgetary planning skills are essential. A retail industry background with IBM 3090 or Amdah 5890 experience would be ideal.

Senior Telecommunications Programmer Analyst

The selected applicant will be a networking professional with demonstrated leadership and supervisory ability, and minimum 8 years of MIS experience including 5 years specifically in telecommunications.

To qualify for our MVS/XA environment your background must also include sysgen experience with VTAM, NCP, CICS, TSO; 3270, 3780, SNA/SDLC, X.25, LU6.2, and other communications protocols and standards. Experience in BTAM, EDI, LAN, WAN and VAN is a plus. Our preferred candidate will have a Bachelor's or Master's degree in Computer Science, or equivalent work experience.

Senior Systems Software Programmer Analyst

Leadership potential and the ability to effectively supervise others is paramount. Minimum 7 years experience in a MVS/XA environment is required, plus a background in JES2, CICS, DASD Management, capacity planning and performance tuning. Experience in VTAM, NCP and NETVIEW is desired. INFO Management, and ACF2 or RACF exposure is a plus. Our preferred candidate will have a Bachelor's or Master's degree in Computer Science, or equivalent work experience.

For immediate evaluation of your credentials, please send your confidential resume with salary history and current requirements to. PAYLESS CASHWAYS, INC., P.O. Box 419466, Kansas City, MO 64141-0466.

- Sommerville Lumber Company
- Knox Lumber
- Furrow Building Materials
- Hugh M. Woods
- Lumberjack Building Materials

Payless Cashways Inc.

Equal Opportunity Employer, M/F

COMPUTER PROGRESS CORPORATION

We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for programmers and analysts in Kentucky, Ohio, Indiana, and Tennessee with one of the following skills.

- IMS/DB/DC
- DB2/SQL
- PL1
- CICS
- Burroughs
- S/38
- IDEAL DATACOM/DB

Send resume or call:
Computer Progress Corp.
8134 New LaGrange Road
Louisville, KY 40222
(502) 426-8133

Computer

SR. SYSTEMS PROGRAMMER

State-Of-The-Art Multi-CPU IBM Shop

Join the new NATIONAL CAR MIS Department! Due to expansion, we have an exciting opportunity for a Sr. Systems Programmer to work on new projects at our world-wide headquarters in Minneapolis. Here you'll find a pleasant metropolitan area, beautiful lakes and many cultural amenities to enjoy.

You will assist in the development and support of a variety of communication projects. 4 years VTAM and NCP systems experience with a MVS environment required. Working knowledge of Assembler, SMP and CICS experience is a plus.

NATIONAL offers a competitive salary and an excellent benefit package. For consideration, please submit your resume to: Cyndee Truesler, Human Resources Department, National Car Rental System, Inc., 7700 France Avenue South, Minneapolis, MN 55435. Equal Opportunity Employer.

Your career deserves National attention.

National Car Rental

Systems Analyst - Education must include BS Degree in Accounting and MS Degree in Management with courses in Management Information Systems and Finance. Must have one year experience as a junior systems analyst using IBM System/36 Computer, SSP Operating System, RPG computer language, IBM Query, IBM Interactive Data Definition Utility (IDDU), and IBM MAPICS II application software in an IBM System/36 computer environment. 40hr/wk, 8am to 5pm, salary $35,000 per year. Duties include supervise daily accounting and manufacturing data processing in IBM MAPICS II applications; assist in the development of accounting and manufacturing information systems to collect data and generate timely reports for cost control and management review; examine the performance of computer regularly and make necessary software upgrading and system maintenance; establish and maintain system security, computer backup routines, and emergency recovery procedures; install computer equipment and implement new software systems; study current and projected user needs and evaluate new computer equipment and software, perform cost-benefit and financial analyses and prepare recommendations to top management; train users and develop operating procedures and instructional materials, provide consultation to users on systems software and application programs; and, design and develop computer programs for manufacturing and business applications. Send resume with social security number to the Indiana State Employment and Training Services, 10 N Senate Ave., Indianapolis, Indiana 46204, Attention: W.F. Shepherd, RE: No. 3085880.

IMMEDIATE OPENINGS

FLORIDA
SOUTHEAST, MIDWEST

Consultants/Contractors: If you have experience in any of the following please send your resume or call us today:

DATANET-Shadowspace
Telecom with C & Unix
CICS with DLI
DBS, Oracle, Model 204
1099's accepted

JAI

MIDWEST - 28000 Middlebelt Rd.
Farmington Hills, MI
313/626-7340
SOUTHEAST - P.O. Box 149466
Orlando, FL 32814
407/896-4582

data processing

We are LYPHOMED ... we offer an exceptional opportunity for dedicated professionals. Our people-oriented company provides a fast-paced working environment where only the highest standards of quality are accepted. If you strive for that same level of excellence, investigate what we have to offer...

PROGRAMMER ANALYSTS

The responsibilities of this challenging position will entail:

- Application maintenance and development
- Providing software support, consultation and validation of software problems
- Developing strategic plans to improve systems and applications as well as software performance

The ideal candidate must possess:

- A minimum of two years control language & RPG III programming experience
- Practical background in IBM System 38
- Payroll Analyst background preferred

This excellent opportunity is available due to our tremendous growth and expansion. As a part of our future success, you will receive excellent starting salaries and an impressive range of full company benefits. Please forward resume, complete with salary history to:

LyphoMed

Nancy Straka
LYPHOMED
3045 Cornell
Melrose Park, IL 60160
equal opportunity employer m/f

"Computerworld is our top choice..."

Cesar Nambo is Vice President for MIS Recruitment for MIS Recruitment at Imperial Corporation of America (ICA), a financial services organization based in San Diego, California. For Cesar, filling important MIS/DP positions is the name of the game.

"*Computerworld* does an excellent job of getting our image across to people - and getting them interested in our company. It's the right vehicle for reaching our target audience."

For all the facts, call John Corrigan, Recruitment Advertising Sales Director, at (800) 343-6474, today.

PROGRAMMER/ANALYST: Design, modify, test, and develop the on-line telecommunication records and information system software for telephone billing package. Design new telephone accounting system software to be integrated with the telecommunication system under a UNIX environment using C and COBOL languages. Evaluate effectiveness; prepare technical memoranda and instruction. Analyze and respond to customer request. Requires Master of Science degree in Computer Science. Education to include one course in computer networking, two courses in UNIX operating systems using C language, two courses in computer information systems and use IS CTIX mega-frame and IBM 3083 during coursework. Hours: 8:00 a.m. - 5:00 p.m. 40 hours per week at $2,208.00 per month salary. Please send resume to: Illinois Department of Employment Security, 402 N. Randolph, Champaign, IL 61820, Attention: Helen Vedder, Reference #0121670##, An Employer Paid Ad.

Data Security Administrator

Systems Programmer

This unique opportunity is offered by Union Electric, one of the nation's largest investor-owned utilities. Our dynamic facility is located in St. Louis, home of fine restaurants, a variety of entertainment possibilities and affordable housing options.

We currently have an opening for a talented Systems Programmer to implement and administer our CA-TOP SECRET program on our corporate computer system. To qualify for this exciting position, you must have a BS in computer science or equivalent with 3-5 years' IBM mainframe experience in supporting OS-MVS, CICS and TSO. Strong leadership, communication and human relations skills are essential to your success.

We can offer the right person a highly competitive salary, comprehensive benefits and potential for advancement. For more information, send your resume to: Bob Moeller, Employment Supervisor; UNION ELECTRIC COMPANY; P.O. Box 149; St. Louis, MO 63166. We are an equal opportunity employer M/F

UNION ELECTRIC

"For Source Edp, Computerworld is a people-and profit-puller."

Dave Grinnell
Vice President & Ad Director
Source Services Corporation
Mountain View, CA

Dave Grinnell is Vice President and Advertising Director of Source Services Corporation, the parent company of Source Edp, the world's largest recruiting firm that specializes in the computer profession. Source Edp has been an advertiser in Computerworld — almost from inception of the publication. Here's why:

"With its fantastic pass-along circulation, Computerworld not only reaches executives in computer management, but programmers, systems analysts and other individual contributors that are in particular demand by our client firms. It helps us reach the heart of our candidate base efficiently."

"Not only does Computerworld reach our market, but it reaches a market that's actively interested in computing and fostering their career growth. Conservatively, over the years, we have helped many thousands of Computerworld readers find new positions within the computer profession; many times more than those readers of other technology or trade publications. How do we know? We have an elaborate tracking system that helps us verify from which media respondents see our ads. Typically, Computerworld generates over four times more respondents who eventually are placed in new positions by Source than the next nearest computer industry publication."

"Because we're national in scope, we need the coast-to-coast coverage and support that Computerworld offers our 75 office network. We've helped Computerworld readers find candidates or move from Houston to Rochester, NY. . . . from Seattle to Miami . . . you name it. That's something that local newspapers, local radio and other media we also use can't accomplish for us with as much direct success."

"In short, why do we depend on Computerworld? First, it's profitable reading for employers. Second, it's profitable reading for those seeking new employment. And third, through our services, it's also profitable reading for us. It's a 'win-win-win' situation for all."

Computerworld. We're helping employers, top professionals and people who help them get ahead get together. Every week. Just ask Dave.

For all the facts on how Computerworld can put you in touch with qualified personnel, call your local Computerworld Recruitment Advertising sales representative.

COMPUTERWORLD

Sales Offices:
BOSTON: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700
NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350
WASHINGTON: 3022 Javier Road, Suite 210, Fairfax, VA 22031, (703) 573-4115
CHICAGO: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433
LOS ANGELES: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164
SAN FRANCISCO: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164

An IDG Communications Publication

Computer Professionals: Some people were created to solve problems.

Let's examine the rather singular Case of the Reluctant Relocator, who came to our digs with his problem. Our NCA consultant immediately deduced, from the grim visage and slumped shoulders, that our visitor was unhappy with his present circumstances. After a thorough interrogation and by applying the three-pipe method of analysis our consultant proffered a solution... relocation! Our visitor agreed, rather reluctantly at first, until he learned that our NCA network, with offices in most major cities, could find him the position he wanted, where he wanted to live... before he moved...and at no cost to him for interview and relocation expenses.

Come in. Call. Or mail your resume to the NCA firm nearest to you. No charge for our services. Confidentiality is assured. Relocation...it's elementary.

[illegible]

National Computer Associates

DIRECTOR OF COMPUTER SERVICES

Excellent opportunity in growth environment. Responsible for Computing Center and all College computer services. Staff includes director, 8 professional staff, secretary, and student assistants. Facilities include VAX VMS systems and PDP-11 RSTS/E systems, LAN with 125 terminals, 125 PC's.

Prefer advanced degree with progressively responsible management experience in computing in higher education and experience with VMS, RSTS, and personal computing.

Good communication and interpersonal skills and the ability to motivate and direct the work of others essential. Project management experience, planning, understanding the academic environment, and organizational ability necessary for success. Salary competitive and commensurate with qualifications.

Located in Jackson (pop. 300,000), the cultural, financial, and governmental center of the state, the College has a recognized standard of excellence, is financially sound, and has an enrollment of 1425, an all time high. With a strong liberal arts and science program, strong pre-professional programs, and the Else School of Management offering the BBA and MBA degrees, the College is a coeducational institution affiliated with the United Methodist Church.

Position available September 1988. To be assured of consideration, send resume, academic transcripts, and names of 3 current references by June 24 to

Dr. Robert A. Shive, Jr.
Associate Dean of the College
Millsaps College
Jackson, MS 39210-0001

MILLSAPS COLLEGE

CONSULTANTS PROG/ANALYSTS

IBM
DB2 QMF or SQL
VM/MVS ORACLE COBOL

HONEYWELL
DPS6 or DPS8

DEC
VAX ARBAT AIMS COBOL
VAX ORACLE COBOL
VAX INTERGRAPH SCRIPT
VAX 8630 - 250 CLUSTER

WANG
VS300 PACE II COBOL

TANDEM
VLX PATHWAY DDL TMF

SALES

We are currently seeking a successful sales representative for our Phoenix branch office.

Candidate should be experienced in selling Systems and Programming services to Fortune 1000 computer installations in Arizona and the greater Los Angeles area.

Unlimited earnings potential comprised of salary and/or commission plus benefits package.

If you consider yourself one of the best, we would like to hear from you.

Please send resume in confidence to:

Euro Systems International Inc.
380 Madison Ave.
Suite 1112
New York, NY 10168
Equal Opportunity Employer

FLORIDA GULF COAST

It's a given fact. Florida is growing. And Florida Power Corporation, servicing over 3 million residents in almost half the state, is growing with her. As our customer base grows, we continually seek enthusiastic, spirited people — who want more out of life than just a job.

Florida Power Corporation, located in the Tampa/St. Petersburg area, is one of the few companies that can honestly offer exceptionally motivated individuals an opportunity to expand their career potential to the fullest.

APPLICATION PROGRAMMER ANALYST II — Customer Billing/Accounting

A bachelor's degree with four years of related accounting and/or customer information systems experience in a large computer environment is required. You'll also need detailed knowledge of ANS COBOL, IBM OS/VS JCL, TSO/ISPF, VSAM, CICS, IBM utility programs and structured programming techniques. Former experience with non-structured style programs will help you to make the necessary modifications. Certification in computer programming (CCP) or data processing (CDP) will give you a definite edge. And strong oral and written communication skills are a must.

As an application programmer analyst II, you'll participate in the analysis, design, development and implementation of modifications and enhancements of the customer accounting system and programs. Occasionally, you'll be required to serve as a project leader on small-to-moderate size projects dealing directly with the customer accounting users or interfacing with other application systems.

APPLICATION PROGRAMMER ANALYST I — Administration

To qualify, you should have a bachelor's degree with two years' relevant programming experience. You'll need a working knowledge of ANS COBOL, IBM OS/JCL, TSO/ISPF and structured programming techniques. Human Resources application experience is highly desirable. You must also demonstrate strong oral and written communication skills.

You'll participate in the analysis, development, implementation and support of business-oriented computer information systems — with emphasis on Human Resources applications.

APPLICATION PROGRAMMER ANALYST I — Operations

For this position, you'll need a bachelor's degree and two years of relevant computer systems design and programming experience. You must have detailed knowledge in ANS COBOL, CICS, IDMS DATABASE, VSAM, IBM OS/VS JCL, TSO/ISPF and structured programming techniques. A working knowledge of VS COBOL II, IDD, ADS/O, OLM and personal computer (PC) software is highly desirable. Certification in computer programming (CCP) or data processing (CDP) is a definite plus. And you must demonstrate strong oral and written communication skills.

FUTURE OPPORTUNITIES

We anticipate the need for additional professionals in diversified positions in the near future. If you are interested in pursuing opportunities with Florida Power Corporation besides those listed above, please send us a resume indicating your areas of interest and expertise.

The selected professionals for all these positions will receive an excellent compensation package, relocation assistance and a salary commensurate with job responsibilities and experience.

For immediate consideration, send your resume including salary history, in complete confidence, to: D.E. Thomas, CW/588, Recruitment, D2A, Florida Power Corporation, 3201 34th Street South, St. Petersburg, FL 33711. No agencies. EOE M/F/H/V

Florida Power CORPORATION

THE EASIEST DECISION YOU'LL EVER MAKE.

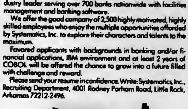
Room with a view.

We are seeking Programmer/Analysts and Systems Analysts, who are interested in a challenging environment with room to grow and a view of the future. With an average annual growth rate of 25% over 20 years, Systematics, Inc. offers itself as an industry leader serving over 700 banks nationwide with facilities management and banking software.

We offer the good company of 2,500 highly motivated, highly skilled employees who enjoy the multiple opportunities afforded by Systematics, Inc. to explore their characters and talents to the maximum.

Favored applicants with backgrounds in banking and/or financial applications, IBM environment and at least 2 years of COBOL will be offered the chance to grow into a future filled with challenge and reward.

Please send your resume in confidence. Write: Systematics, Inc., Recruiting Department, 4001 Rodney Parham Road, Little Rock, Arkansas 72212-2496.



SYSTEMATICS, INC.

• Principals only • An Equal Opportunity Employer

Programmer Analysts, Systems Analysts, Systems Programmers

CICS Prog. Analyst (Mfg./COBOL)	$38K
DB2 Prog. Analyst (Fin./COBOL)	$37K
MVS Sys. Prog. (Gens/Tuning)	$46K
CICS Sys. Prog. (Maint./Debug)	$48K
Sr. Sys. Analyst (CICS/COBOL)	$39K
MSA Prog. Analyst (COBOL/CICS)	$36K
CSP Prog. Analyst (COBOL/Fin.)	$37K

It would be in your best interest to exclusively contact an agency that is well established member of a national network and will give your career interests top priority. Please send resume to Robert Montgomery.

The Data Group
P.O. Box 52055
Raleigh, NC 27612

MVS SYSTEMS PROGRAMMER

Outstanding expansion position is currently available in a midwest-based MVS, IMS, DB2, Jes 2 environment. Must have 4+ years of MVS support or Assembler or SMP/Syngen experience. This shop is people oriented and state-of-the-art. Excellent opportunity. $40,000+

DATA PROCESSING
7730 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

PACBASE

Beatrice/Hunt-Wesson, Inc., headquartered in Southern California is seeking a Sr. Programmer Analyst with PACBASE experience.

Responsibilities include providing PACBASE consultation support to the applications development staff in our IBM 3090 OS/MVS shop. You will also assist in PACBASE administration functions and systems support of electronic data interchange.

This position requires a minimum of eight years programming experience in a large IBM mainframe shop. A two-year background in PACBASE is essential in addition to familiarity with COBOL, OS/JCL, TSO/SPF, and VSAM, with CICS a plus. A BS degree is highly desirable.

For immediate consideration, forward your resume and salary history to:

Beatrice/Hunt-Wesson, Inc.
Attn: Beth Adams
Staffing Representative
1645 W. Valencia Drive
Fullerton, CA 92633-3899

EOE. M/F/V/H

KENDA SYSTEMS, INC.
Boston • New York • Washington

SOFTWARE CONSULTANTS

KENDA SYSTEMS provides consultants to the East Coast High Tech Community. Talented professionals who take pride in their work are welcome to register with KENDA SYSTEMS.

Current Requirements include:

* DATABASE:	VAX/VMS/RELATIONAL DB DESIGN
* DRIVERS	VAX/VMS (I)/MACRO-32 AND C
* PAB:	VAX/VMS/C/X.25
* PORT:	CONTROL SYSTEMS PORT MS-DOS TO XENIX
* SYSTEMS DESIGN:	VAX/ADA/[illegible]/ STRUCTURED DESIGN
* QA:	NETWORK TESTING/ X.25/SNA
* COMMUNICATIONS:	C/TCP IP/INTERFACE
* GRAPHICS:	UNIX/C/[illegible]/ WORKSTATION SOFTWARE
* DIAGNOSTICS:	RSX/UNIX/C
* TEST:	PC AND MAINFRAME FOCUS SYSTEMS
* TECH-WRITER:	USER MANUALS/C LANGUAGE

Forward resume to D. Sterra.

[illegible]

Map Out a New Career at CIBER

With many companies, the prospect of an exciting career with long-range opportunities is limited by one element—location. CIBER knows that the environment in which you work and live affects your personal satisfaction. A career with our rapidly expanding consulting firm will allow your future to take shape in a choice of data processing markets.

Our employees are salaried and receive generous benefits including relocation assistance. If you have a minimum of 3 years experience, we can offer you a wide range of technical opportunities in diverse industries using the latest systems and computer technology.

Openings are currently available in the following locations for data processing professionals who are experienced in these preferred fields.

NORTHERN CALIFORNIA
IDMS, ADS/O
DB2/SQL
ADABAS, NATURAL
IMS DB/DC
CICS
COBOL

Gary Preston
1010 Hurley Way
Suite 300
Sacramento, CA 95825
(916) 929-2725
or
Robert Ashow
3476 Buskirk Ave.
Suite 1045
Pleasant Hill, CA 94523
(415) 935-3414

MINNESOTA
IMS DB/DC

DENVER
IMS DB/DC
DB2/SQL
TELON
ORACLE
FOCUS
SAS
CICS
FORTH
M204

For Memphis or Denver, please contact: Beth Kern
1776 S. Jackson St.
Suite 804
Denver, CO 80210
(303) 691-2273

DALLAS
CICS, COBOL
PC, COBOL
IMS DB/DC
DB2/SQL
RPG II/RPG III
FOCUS
SAS
IDMS ADS/O
ADF2
ADABAS, NATURAL
TELON

Angela Bettani
14901 Quorum Dr.
Suite 235
Dallas, TX 75240
(214) 458-0777

PHOENIX
DB2/SQL
IMS DB/DC
CICS/DL/I
GFIS
TRANSFORM (HOLO)
ACP/TPF
UNIX® "C"
EASYTRIEVE PLUS
IDEAL, DATACOM

Dan Pellman
3003 N. Central Ave.
Suite 2512
Phoenix, AZ 85012
(602) 234-0411

MINNESOTA
IMS DB/DC
DB2/SQL
IDMS ADS/O
COBOL, PL/1
CICS
REXX, XEDIT, EXEC 2
TELON
FOCUS
HP 3000
S/38, RPG III, CL

Norma Ortiz
1000 South
Suite 4225
Houston, TX 77002
(713) 658-0401

ATLANTA
S/36, S/38
MAPICS
DATACOM DB
IDEAL
UNIX®"C"
DB2/SQL
TECHNICAL WRITERS
CICS
IMS DB/DC

Dale Carringer
30 Perimeter Center East
Suite 201
Atlanta, GA 30346
(404) 399-6325

UNIX® is a registered trademark of AT&T

CIBER
An Ethic of Excellence
An Equal Opportunity Employer M/F

Senior Technical Computer Consultant: To consult with client, analyze procedures & problems, using specialized knowledge of project requirements. Confer with personnel to ascertain specific output requirements, study data to improve production. Specify in detail logical and/or mechanical operations, conduct studies, develop new information systems. BS in computer science or equivalent in experience. 3 years practical engineering experience in UNIX "C" programming, & a SQL-based database package (INFORMIX, ORACLE, or UNIFY) developing business or technical applications. Strong theoretical & practical knowledge of relational database theory. Previous consulting experience, communications skills. 40 hour week, 8-5, M-F. $37,500 per year. Send resume to: Job Service of Florida, 3421 Lotton Road, Orlando, FL 32803. JO# FL-[illegible]

PROJECT MANAGER/ SR. SYSTEMS ANALYST NEW YORK CITY

In charge of development, design, installation and after sales support of communications systems such as message switching, electronic fund transfer and voice response for large corporate clients, utilizing IBM Series/1 computer and EDX operating system. Supervise a team of system analysts and programmers. Bachelor Degree in math/statistics/computer science and 3 years exp. as Senior Systems Analyst-Communication Systems or 72 credits or equivalent courses in system analysis and programming plus 7-8 years experience as a Senior Systems Analyst in communication systems. 37 1/2 HR/WK, $55,000+ commensurate with experience. Send resume or letter in duplicate describing qualifications to: RVB #258, Room 501, One Main Street, Brooklyn, NY 11201.

S/38

Programmer/Analysts for software development & consulting positions in various locations. Flexible relocation policy. Move with us to "Silverlake"!. Send resume to:

Mincron
350 First Ave.,
Suite 7120
New York, NY 10118
(212) 736-7970

UNISYS

DMS 1100, DMS II, MCP, GEMCOS, CANDE, WFL, MAPPER, COBOL, TELCON, and EXEC professionals needed now for special opportunities from coast to coast. To confidentially explore exciting new career opportunities, rush a resume or call Gary Repetto, CPC.

DUNHILL OF ALBUQUERQUE INC

1717 Louisiana NE, Suite 218C
Albuquerque, NM 87110
(505) 262-1871
Exclusively Employer Retained

SOFTWARE SPECIALISTS

Now is the time

Challenging opportunities exist for experienced Technical Professionals in our Customer Support Center in Colorado Springs.

We are looking for professionals who have superb communication skills—who thrive in a customer support setting—to consult with our customers on a one-to-one basis. You should be able to work as an active team member while researching and structuring innovative solutions to complex software problems.

We are looking for qualified applicants with a degree in Computer Science and/or the equivalent experience specific to the following disciplines:

VAX/VMS* Support

You must have 2 or more years experience with VMS as a system manager or from a strong user level support role.

Network Support

You must have 2 or more years experience with one of the following Digital Networks and Communications products:

- DECnet,* VAX* and/or DECnet RSX*
- Ethernet Technology
- Ethernet Terminal Servers
- DECserver 100/200*

For immediate consideration, please send your resume to: Ms. Barbara Cusack, Dept. 0516 8804, Digital Equipment Corporation, 305 Rockrimmon Blvd. South, Colorado Springs, CO 80919.

We are an affirmative action employer.

*Trademarks of Digital Equipment Corporation

Be part of the story. . . now.

digital™

PROGRAMMER/ ANALYST SYSTEM 3/X

POSITION: Assist in the design, programming, implementation and ongoing support of multiple distribution systems throughout the country. Individual selected for this position will have a thorough knowledge of both System/36 and 38 in a structured programming environment, and will be a major contributor to a centralized systems and programming department. An experienced hands-on manager with three to five years experience could qualify for this position. Emphasis will be placed on technical depth. We are an IBM VAR and anticipate installation of our development System/3X add-on in early July 1988. Anticipated travel of 25%.

COMPANY: The world's largest wine manufacturer is offering an unusual career opportunity with excellent challenge and rewards, including an outstanding fringe benefits package.

LOCATION: Work in central California's beautiful San Joaquin Valley 90 miles from San Francisco. This agricultural community is located 45 minutes from the Sierra Nevada Mountains.

Please send resume and salary history, in complete confidence, to:
Professional Staffing Department, CW
E. & J. Gallo Winery,
P.O. Box 1130,
Modesto, CA 95353.

E. & J. GALLO WINERY

An equal opportunity employer. M/F/H

DATA PROCESSING ADMINISTRATOR

CITY OF DES MOINES

Will manage and direct a comprehensive municipal data processing installation, its structured systems, and peripheral equipment. Directs the development of systems, programs, procedures, and forms. Prepares estimates of personnel and machine requirements. Prepares annual operating budget for the data processing section of the Finance Department. Requires a Bachelor's degree in business, accounting, or data processing and five years of experience in a large mainframe data processing operation. The City's Residency Requirement is in effect for this position. Salary is $45,183-$56,887. Send resume to Personnel Department, Room 168, City Hall, East First and Locust Streets, Des Moines, Iowa 50307 by June 10, 1988.

EOE/AA

PROGRAMMERS

Jr to Sr level programmers with 1+ yrs exp in IBM & other languages (PASCAL, "C", ASSEMBLER, PL-1 etc.) Contract assignments 12 mos + $25-30/hr + benefits package. In confidence, contact Al Gleason, CPC.

CORPORATE PERSONNEL CONSULTANTS, INC
3700 Latrobe Drive, Suite 200
Charlotte, NC 28211
(704) 365-1620

FLORIDA

DBA
$48,000

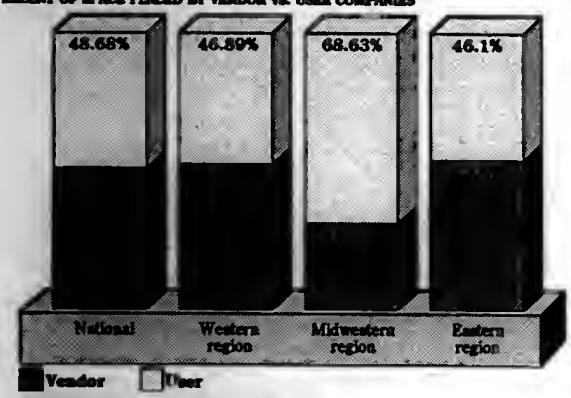
Fortune Listed Corp Seeks in Depth exp as DBA in an IMS DB/DC environment. Any knowl of DB2 a plus, but not nec. 1-800-888-2373

Russell Thomas Associates
3200 North Lois Ave.
Suite 100
Tampa, FL 33607
(813) 870-0500

CAREER INDEX

March 1988 computer recruitment advertising activity*

PERCENT OF SPACE PLACED BY VENDOR VS. USER COMPANIES



*Analysis of computer recruitment advertising space in Computerworld and selected major U.S. newspapers

INFORMATION PROVIDED BY CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATA BASE

ROMAC®

DATA PROCESSING · ACCOUNTING & FINANCE · BANKING

Selectivity - Not a Stack of Paper

Selective interviewing at ROMAC® means we send you only fully qualified professionals, not an army of names to wade through. Our clients expect this service, our candidates demand this confidentiality. It is an important ROMAC® Difference and why in Data Processing, Accounting, Finance and Banking The ROMAC® Difference really is better.

Contact one of our offices today:

California
Costa Mesa 714-850-0788
San Francisco 415-788-2815

Connecticut
Hartford 203-525-8037
Milford 203-877-7545
Stamford 203-358-8155

Delaware
Wilmington 302-658-6181

Florida
Ft. Lauderdale 305-928-0811 Broward Area, 305-949-7762 Dade Area
Jacksonville 904-358-6868
Orlando 305-843-0765
Tampa 813-229-5575, 813-821-2861 St. Pete. Area

Georgia
Atlanta 404-688-0033

Illinois
Chicago 312-263-0902

Maine
Portland 207-773-4749

Massachusetts
Boston 617-439-4300
Wellesley Hills 617-239-0900, Boston Tel. # 617-439-8961

Michigan
Detroit 313-567-2600

Minnesota
Minneapolis 612-893-6880

Missouri
St. Louis 314-231-6334

New Hampshire
Manchester 603-627-6269
Portsmouth 603-431-2706

New Jersey
Paramus 201-599-0522

New York
Albany 518-463-6644
Buffalo 716-853-6203
Rochester 716-232-4610

North Carolina
Charlotte 704-333-3166
Raleigh 919-878-4454
Winston-Salem 919-725-1933

Ohio
Cleveland 216-771-6822
Columbus 614-221-7077
Dayton 513-461-1373

Pennsylvania
Bala Cynwyd 215-667-7351
Philadelphia 215-568-6810
Wayne 215-687-6107

Rhode Island
Providence 401-421-2250

Tennessee
Memphis 901-523-0500

Texas
Dallas 214-720-0050
Houston 713-227-7700

Virginia
Richmond 804-644-0196

Washington
Bellevue 206-646-6640

Washington, DC
202-775-9055

All ROMAC® offices are individually owned and operated franchises of Romac and Associates, Inc.

Energy Management Computer Analyst

Will design, code, debug, and maintain energy management computer software. Involves mini/micro computer operating systems design and programming, languages design and programming, Real Time Data Base Control, Process Control Algorithm Design and Programming, design and programming of hardware interface software, using machine language, assemblers, Pascal and C Compilers. Supervise programmers on team software development projects. Coordinate system software design with hardware design engineers. Travel to various out-of-state locations to coordinate design projects with consulting engineers, software houses and similar departments in other organizations.

Requires Master's in Computer Science, plus two years experience in Process Control Software or Bachelor's in Computer Science plus four years experience in PCS or a combination of education and experience from which similar capabilities can be demonstrated. Salary open.

Apply with letter of application, resume and names of three references postmarked by May 23 to:

Mr. Jim E. Hines
Energy Conservation Manager
University of Nebraska-Lincoln
Lincoln, Nebraska [illegible]
(402) 472-3131

Affirmative Action/
Equal Opportunity Employer

PERMANENT AND/OR CONSULTING POSITIONS

DEC
- Programmers–VAX, VMS, BASIC, banking experience a +

IBM
- Prog'rs-FOCUS experience necessary
- Commun Spec.-CICS, TCAM

HONEYWELL
- Prog'rs-GMAP, GCOS, 3 or 8

Please call 212-684-3686
Or Submit Resume To:

HANK WALSH ASSOCIATES
475 Fifth Ave, NY, NY 10017

E-SYSTEMS

SATELLITE SYSTEMS/ SOFTWARE ENGINEERING OPPORTUNITIES

At E-Systems ECI Division our job means providing state-of-the-art career opportunities that allow visions to be molded into realities. Offering new and exciting challenges help keep us on the leading edge of present day technology.

Satellite Systems Engineers

MS or PhD in electrical engineering, math, or computer science and experience in one or more of the following disciplines:

- Statistical Communications Theory
- Signal Coding/Design/Error Control
- Modulation/Detection Theory
- Digital Filters/Optimal Estimation
- Satellite Link Performance Prediction/Analysis
- Spread Spectrum/Frequency Hopping
- Millimeter Microwave Component & System Performance
- EW, A/J, LPE Vulnerability Studies
- MIL-STD-480A Specifications
- MIL-STD-2167 Software Requirements.
- Systems Project Management

Digital Signal Processing Engineers

BS or MSEE with minimum 5 years experience in one or more of the following areas:

- Digital Design for Signal Processing
- SSI, MSI, LSI Design Implementation
- Develop & Test Prototype Circuits
- Military Space Hardware Design
- Communications Modems

Program Manager - Space Systems

Ten years program management experience with satellite communications systems. Space systems hardware experience as well as an engineering degree required.

Software Engineers

BS or MS degree in electrical engineering or computer science with eight years experience developing medium to large software systems. Candidates must be familiar with DoD standards, especially DoD-STD-2167, experience fabricating programs using ADA, and be acquainted with one or more software analysis/design methods such as SA/SD, JSD, PAMELA or OOD.

If you are attracted to a dynamic work environment and have the solid experience required for one of the above opportunities, respond immediately by sending your resume to: **Director of Employee Relations, E-Systems, Inc., ECI Division, Post Office Box 12248, St. Petersburg, Florida 33733.**

E-SYSTEMS
The science of systems.

Principals Only, Please.
U.S. Citizenship Required.
An Equal Opportunity Employer, M/F, V, H.

DATA PROCESSING OPPORTUNITY IN FLORIDA

Embry-Riddle Aeronautical University invites applications for the following position located in Daytona Beach.

Programmer Analyst

Provide design, analysis, documentation, and implementation of computer systems for the University. A minimum of 2 years experience using COBOL on a HP 3000 along with a computer related degree is required. College/University background and COGNOS experience is preferred.

Salary commensurate with experience. Excellent benefits package. Send letter of application, resume, and salary requirements in confidence to: Embry-Riddle Aeronautical University, Office of Human Resources, Spruance Hall, Daytona Beach, Florida 32014

Equal Opportunity Employer

Computer

IBM SYSTEMS PROFESSIONALS

Booz Allen & Hamilton, a world leader in technology and management consulting, has immediate openings in the Washington, D.C. - Baltimore, Maryland area. We are seeking IBM systems professionals with B.S./B.A. degrees and at least two years of experience in one or more of the following:

- **CRYSTAL**
- **BEST/1 (MVS/SNA)**
- **SAS (MXG)**
- **Capacity planning (three years)**

As a member of our rapidly growing Information Technology Center, you will receive a competitive salary and a generous benefits package while you take on challenging assignments. For consideration, please call Virginia Andery at (301) 951-4582, or send your resume to her:

BOOZ-ALLEN & HAMILTON INC.
Dept. 9022
4330 East West Highway
Bethesda, Maryland 20814
Equal Opportunity Employer

Software Design & Development, Inc.

The UNIX® Specialists

Software Engineers
*We Need Your Experience**

Unix/C
with Strong Database
• 4GL a Plus •

Call or send Resume for immediate response

P.O. Box 10877
454 South Anderson Rd
Rock Hill, SC 29731
1-800-634-8086

*3 years minimum experience

NORTHEAST DATA

NCR Specialists

Personnel Placement

(603) 664-5431

Consulting Opportunities

Programmers, Designers, Analysts, DBA's, Technical Writers, System Analysts, Administrators, Engineers sought for per diem and permanent positions.

- DB2 SQL
- CICS
- IMS
- COBOL
- PL/I
- FOCUS
- NOMAD
- ADABAS/NATURAL
- UNIX (Appl. & Int'ls)
- INFORMIX
- C
- SYBASE
- IDEALADS
- VAX/VMS
- BUYBROKERS [illegible]
- EDP AUDITORS
- PC's
- DATA COMM
- DESIGN ENG'RS
- SOFTWARE ENGR'S
- HARDWARE ENGR'S
- MECHANICAL ENGR'S
- AVIONICS
- TESTERS

Other positions also available. Please call or send resumes to: Recruiters

Structured Logic Systems, Inc.

2470 Windy Hill Road, Suite 364, Atlanta, GA 30067
Two Penn Plaza, Suite 1540, New York, NY 10121
1-800-537-1152

Must Have Minimum Two Years Experience

GEORGIA • NEW YORK • NEW JERSEY • TEXAS • MASSACHUSETTS • DC

RESEARCH TRIANGLE OPPORTUNITIES

Manager, System Software Research and Development for specification, design, coordination, implementation & management in commercial development of proprietary, transparently distributed operating systems for 68000-based multi-processors in Unix "C" development environment. Awareness of system self-configuration, network consistency, performance monitoring & real-time Unix compatibility in process management. Exploratory knowledge engineering for configuration control & error processing using rule-based, object oriented & declarative software development & simulation methods for parallel processing. Coordination in domestic & international marketing & sales support of computer systems for process control in factory automation, (automatic control) & Supervisory Control Applications with Data Acquisition (SCADA). Frequently called upon to lead a group of professionals in system software development. Master's Degree in Electrical Engineering or Computer Science required as well as two years experience in job offered. Candidate must have completed one course in each of the following areas: automatic control & statistical modeling methods or other simulation methods. 40 hours, 8:30am to 5:00pm, $37,800/yr. Send resume to Illinois Dept. of Employment Security, 401 S. State-3South, Chicago, IL 60605, Attn: Marla Newman, Ref# 8081-N. Employer paid ad.

MAJOR EXPANSION

Our Texas client, located in a beautiful mid-sized community, is committed to expanding its life insurance systems group. This is a major staffing effort and will require:

Life Insurance Analysts
IBM Programmer/Analysts
MVS Systems Programmers
IMS or DB/2 Data Base Analysts

This firm is an established, people oriented employer, with an outstanding national reputation. In addition to career growth, the benefits offered are:

Competitive Salaries
Four Day Work Week
Generous Relocation
No State or Local Income Tax
and more......

For more information on this opportunity call, or better yet, send your resume to:

Robert Shields & Associates
P.O. Box 890723, Dept. S
Houston, TX 77289-0723
800-423-5383

P.S. We have hundreds of other openings throughout the U.S.

Airline Systems End User Analysts/ Application Programmers

Choose the company whose systems are being increasingly chosen by the world's airlines...Unisys.

Unisys is consistently the leading supplier of airline computer and application systems. In fact, 12 of the top 20 airlines use the Unisys USAS System. Unisys Airline Development and Support Center in Minneapolis, MN and the airline industry have experienced tremendous growth and challenges over the past year.

This dynamic growth has nurtured the development of USAS 2000, the most advanced airline system. EDP professionals and user analysts are needed to assist USAS 2000 in becoming the dominant force within the airline industry.

Positions are available for those professionals with 2+ years experience in:

- Design and development of real time, large scale software applications within a Unisys 1100 or other large scale mainframe environment utilizing FORTRAN, COBOL and MAPPER.
- DMS, CMS, HVTIP.
- Reservation systems, cargo systems and other related airline application systems.

These positions are located in Minneapolis, MN or require extensive travel to various worldwide locations.

To be considered for these challenging opportunities, forward your resume to: **Unisys Development Center, Attn: Rodney Smith, Worldwide Technical & Project Staffing, Dept. C23, P.O. Box 64663/MS F3K08, St. Paul, MN 55164-0663 or, call (612) 687-2267.** An affirmative action employer.

UNISYS

System Developers
800 231 5920

Inviting resumes from individuals in the more highly technical computer related vocations such as: PhD Computer Scientists, Operating System Developers, Architecture, Networks, Data Base Developers, Microcode, Compiler, Artificial Intelligence, etc. Similar interest in scientific applications including data acquisition, military, process control, CAD/CAM, simulation, etc. We are a professional employment firm managed by graduate engineers. Fees are paid by the employer. All geographic locations. Send resume or call and ask for our free Resume Workbook & Career Planner. Scientific Placement, Inc., P.O. BOX 19949 CW, Houston, TX 77224, (713)496-6100

Scientific Placement, Inc.

SOFTWARE SPECIALISTS

In the fast changing world of data processing, many find that secure, challenging opportunities elude them. At Merit Systems, we understand the needs of our highly talented staff of software professionals. We hire, challenge and develop our staff to be the best in the industry.

Merit Systems record of growth stands well above the industry average, creating on-going opportunities nationally for our staff to grow professionally and new requirements for tenacious, self-confident individuals who are ready for above average achievement and rewards. The successful candidates will have a minimum of 2 or more years experience in one of the following disciplines:

- TANDEM
- DB2/SQL
- NOMAD
- ACP/TPF
- IMS DB/DC
- DATACOM

Merit Systems support for your career goals is virtually unequaled in the data processing field. We provide an excellent salary, bonus, benefit, profit sharing and continuing education program. To immediately pursue your Merit career call collect or send your resume to:

[illegible]
[illegible]
(313) [illegible]
Merit Systems, Inc.
National Headquarters
[illegible] Suite [illegible]
Troy, MI [illegible]
FAX # (313) [illegible]

Merit

• ANALYSTS • PROGRAMMERS
SOFTWARE/HARDWARE

RSVP SERVICES

Multiply Your Opportunities

With a network of over 1000 client companies and 200 affiliate employment agents nationwide, RSVP can selectively communicate your credentials to companies offering literally hundreds of choice, current career opportunities, clear across the nation.

We guide, You decide

Our no-obligation, no-pressure employment services to degreed, experienced U.S. citizens and permanent residents include resume development and interview arrangement.

If you qualify, call Howard Levin or Maureen McCue at 800-222-0153 or (in NJ) 609-667-4488, or send your resume to either address listed below. Our client companies pay all costs.

RSVP SERVICES
One Cherry Hill Mall, Ste. 614, Dept. C, Cherry Hill, NJ [illegible]
[illegible] Suite [illegible], Dept. C, 1777 Walton Rd. Blue Bell, PA 19422 (Mail address only)
Member: computer/net
National placement network

Major new facility comparable in size and scope to NSF supercomputer centers. CRAY X-MP to be upgraded to Y-MP in October 1989, runs UNICOS and emphasizes UNIX and visualization. TCP/IP and DECNET state-wide network provides high speed access. Seeking intelligent and motivated group leaders and staff in visualization, systems and programming, scientific support and user services, networks and technical writing. Compensation comparable to NSF Centers.

Desirable experience includes UNIX, scientific programming, TCP/IP, visualization, teaching and consulting on major packages. Early availability desirable.

The Center is located adjacent to The Ohio State University campus in Columbus. Metropolitan Columbus offers excellent recreational and cultural opportunities, good school systems and very attractive and affordable housing.

For further information please contact Alison Brown at (614) 292-9248. Or send application letter and resume to: Ohio Supercomputer Center, 1224 Kinnear Road, Columbus, OH 43212, ATTN: June Stiefel.

An Equal Opportunity Affirmative Action Employer

For over 15 years the best companies have called on CRG to find superior data processing professionals to meet their needs.

Give us a call or mail your resume today to find out what we can do for you. 300 Sacramento Street, San Francisco, CA 94111, (415) 398-3535 -OR- 3350 Scott St., Suite 130A, Santa Clara, CA 95054, (408) 727-1480.

The Computer Resources Group, Inc.

DIRECTOR COMPUTER/MANAGEMENT INFORMATION SERVICES

Pensacola Jr. College in Pensacola, Florida is seeking to fill the above position with primary responsibilities being: Planning and implementing software and hardware systems technology to manage effectively administrative and instructional functions of the college and supervising management systems and computer operations personnel. A master's degree in management systems or information systems and five years of full-time progressively responsible administrative experience preferably to Burroughs/Sperry (Unisys) mainframe technology are required. A doctor's degree may be substituted for up to two years of the required experience. SALARY: [illegible] - [illegible] DEADLINE TO REQUEST APPLICATION MATERIALS: May 25, 1988. APPLICATION DEADLINE: June 1, 1988. To request materials call (904) 476-7780. Refer to Job #[illegible]. PJC - An Equal Opportunity Institution.

1000 DP Opportunities

[illegible]

Corporate Personnel Consultants

MVS PROGRAMMER

The successful candidate will develop Expert System software for the IBM Mainframe in a MVS/XA environment running under CICS and TSO. C programming experience with knowledge of Pascal, FOCUS and Expert System technology desirable.

Send resume/letter of introduction:
LEVEL FIVE RESEARCH, INC.
503 5th Ave, Indialantic, FL 32903

MAINE - NH

We have specialized in data processing professional placement in Maine & NH for a quarter of a century. If you qualify for positions in the $25,000-$50,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC.

Att: Dept. 2
P.O. Box 7040DTS
Portland, ME 04112
(207)773-4749

EUROPE/ FAR EAST

Plus 500 openings in Southeast/Southwest/Texas/California cities. Key needs are: 1 Sr. DBA/DB2 Data Administrator, DB2 all levels, NATURAL (II), IDMS/ADSO, Systems 38, & M&D/MSA packages, FOCUS with IMS or CICS. Many other diverse needs. Forward your resume and/or call for our national/international job listing.

International Search
[illegible]

CICS/IMS/VSAM made easy!

Now, build your DP skills . . . and bypass months—even years—of heavy on-the-job experience. DP Series handbooks help you overcome programming/analysis problems and make easy work of mastering CICS/IMS/VSAM in record time. More than 33,000 DP pros have chosen our DP Series handbooks over others. Act now—try any or all of the guides Free for 15 days. After the 15 days, send a check/money order for the books you order, plus postage & handling. Or, return the guide(s) within 15 days and owe nothing.

CICS/VS Command Level Programming with COBOL Examples
By David Lee (13388-4) $32.00 15,000 CICS programmers turn here for quick, reliable answers. You get 271 fully worked-out examples, plus 15 major CICS applications, each demonstrated by a sample CICS program. CICS mapset coding, Production Abend Handling, Online report printing, Pseudo Conversational CICS program design, coding, testing and implementation, and much more!

CICS/VS Online System Design and Implementation Techniques
By David Lee (13393-4) $32.00 Gain 3 years solid CICS experience—in just a few months! Get step-by-step coverage of CICS advanced features . . . design, testing, and implementation methods . . . solutions to 100 most common application problems . . . and 15 major CICS applications, each demonstrated by a sample CICS program.

IMS/VS DB/DC Online Programming Using MFS and DL/I
By David Lee (45216-9) $32.00 Discover why 6,000 IMS DB/DC programmers—and AT&T—use this guide daily to simplify work-day tasks. Bursting with 245 practical examples, plus 9 major IMS DB DC applications . . . this time-saver is all the online programming help you'll ever need.

IMS/VS DL/I Programming with COBOL Examples
By David Lee (45217-7) $32.00 Stock up on DL/I data base and DL/I batch programming know-how: 212 practical examples. DL/I JCL setup, BTS II testing, Data Base access methods, DBDGEN and PSBGEN utility usage, Data Base load, Logical Data Base and Secondary Index Design and Processing, and more!

VSAM Coding in COBOL and VSAM AMS
By David Lee (94414-0) $30.00 Become a VSAM expert in 1 month! You'll get 14 major VSAM applications in COBOL, plus 53 AMS examples covering VSAM file creation and maintenance. Worked-out COBOL examples and OS VOS DOS VS JCL on VSAM files save you hours of work.

Order your 15-DAY FREE copies from:
Robert P. Corley, Prentice Hall
College Mail Order Sales Dept.
Englewood Cliffs, NJ 07632
201-767-5937

FREE shipping when you send payment + your state's sales tax with your order. Same 15-day return privilege. Make check/money orders payable to Prentice Hall.

UNIVERSITY OF ST THOMAS

A teaching-oriented liberal arts university in Houston is looking for a faculty member qualified in Management Information Systems and/or Computer Science to start August, 1988; salary is open.

Please send resume to:

Ms. Samson
University of St. Thomas
3812 Montrose Blvd.
Houston, TX 77006

PROGRAMMER/ PROGRAMMER ANALYST
IBM S 36

N.E. Connecticut manufacturer seeks S36 RPG II Programmer with 1-2 yrs. experience and programmer analyst with 2-3 yrs. experience. Excellent pay, benefits and opportunity for advancement. Inquiries welcome or send resume to:

[illegible] International Corp.
P.O. Box 179
[illegible], CT [illegible]
(203) 774-[illegible]
Attn: [illegible]
E.O.E.

PROGRAMMER/ ANALYST

Aggressive multi-line P&C insurance company seeks a highly motivated data processing individual who is a non-smoker and willing to relocate. Job responsibilities will be to design, code, test, document and implement insurance applications on a Basic Four 8000 computer system using BASIC programming language. Insurance programming experience required.

Send resume and salary requirements to:

Data Processing Manager
P.O. Box 4400
Tulsa, OK 74159-0400

ASSIGNMENT SAUDI ARABIA

THE KING FAISAL SPECIALIST HOSPITAL AND RESEARCH CENTRE in Riyadh, Saudi Arabia offers exceptional opportunities for experienced and qualified Data Processing Specialists. The Hospital, a 500-bed specialty referral complex with a large outpatient clinic, is the Kingdom's premier hospital dedicated to providing high quality health care to the citizens of Saudi Arabia.

Positions are available now or periodically for:

DATA BASE ANALYST–B.S. degree in Computer Science or equivalent. Five years DP experience with 2 years in data base design, control and management.

PROGRAMMER ANALYST–2-4 years of college level course work in Computer Science, 2-3 years experience utilizing CICS & COBOL.

All applicants must be thoroughly familiar with IBM hardware, DL-1 database, CICS & COBOL and VSE/SP systems. Hospital DP experience is highly desirable.

SENIOR COMPUTER OPERATOR–Formal technical training in data processing (AS degree preferred). 5+ years of experience as a computer operator with at least 2 years of lead operator/supervisory experience.

COMPUTER OPERATOR– Two years of technical training in data processing, 3 years of computer operations experience.

Salaries are attractive and potentially tax-free for those who qualify. The exceptional benefits include 30 day annual leave with round trip airfare to point of orgin, mid year 7 day leave plus 13 holidays a year, bonus pay and severance pay at contract end. The selected candidates will be employed by and have a contract with the Government of the Kingdom of Saudi Arabia.

For further information and/or to apply, please call our toll-free number (800) 261-2561 or send your resume to: HCA International Company, P.O. Box 550, Dept. CW-0516, Nashville, TN 37202. HCA is an Equal Opportunity Employer.

HCA International Company

FLORIDA

- PA TANDEM SCOBOL ...... TO $[illegible]
- PA OS/MVS CICS TO $[illegible]
- SE X.25 UNIX C .. TO $[illegible]
- SE SYS88 ...... TO $[illegible]
- SE ADA [illegible] ... TO $[illegible]
- PA MIDOS C ASSEMBLER ... TO $[illegible]
- INFO CTR ANAL FOCUS ...... TO $[illegible]
- PA ADABASE NATURAL ...... TO $[illegible]
- PA RPG SYS38 ... TO $[illegible]
- SR PA IMS PL/1 .. TO $[illegible]
- PA IMS DB/DC CICS ...... TO $[illegible]
- PA CICS COBOL TO $[illegible]
- PA MSA PACKAGES ...... TO $[illegible]
- P/A IDMS ADSO TO $[illegible]
- P/A CICS DOS MPS ...... TO $[illegible]
- CAD ANALYST ... TO $[illegible]
- QA ADA MIL SPEC .. OPEN
- PA M & D PACKAGES ...... TO $[illegible]
- PA PL1 REXX VM TO $[illegible]
- PA DB2 SQL PL1 VM ...... TO $[illegible]
- PA INFORMIX VMS ...... TO $[illegible]
- PA MIDOS D BASE II ...... TO $[illegible]
- PA ACCTS PAYABLE ...... TO $[illegible]
- PA PICK ...... TO $[illegible]
- PA DB2 MSA PKGS ...... TO $[illegible]
- PA UNIX C ...... TO $[illegible]
- PA MAINT VIPS ... TO $[illegible]
- SA PASCAL DBMS ...... TO $[illegible]
- PA ASSM CICS ... TO $[illegible]
- PA VAX PASCAL TO $[illegible]
- PA PC LAN ...... TO $[illegible]
- PJT LDR POS SYSTEM ...... TO $[illegible]
- MGR DISTRIBUTION SYS ...... TO $[illegible]
- PA IDMS INVENTORY ..... TO $[illegible]
- PA IDMS DMIV .... TO $[illegible]

Many other contract and permanent opportunities local and nationwide.

COMPUTERPEOPLE

3[illegible] W. Cypress Creek Rd., #3
Ft. Lauderdale, FL 33309
(305) 771-[illegible]

or

12[illegible] 28th St. North
St. Petersburg, FL 33702
(813) 573-[illegible]

SYSTEMS SOFTWARE ENGINEERS

Higher Aspirations? Join the StorageTek Team in Colorado.

Storage Technology Corporation is The Information Storage and Retrieval Company. Exciting new products mean a solid commitment to software development as a major initiative in our dynamic growth plans. It's a fast-paced scene for the following professionals.

Software Engineering Manager

Your responsibilities will include managing a department of software engineers in the development of software products for revenue.

Ideal candidate will have established track record in the leading development of complex systems software for an MVS/VM operating system environment. Position requires a BS/MS in CS or equivalent, with a minimum of 14 years experience.

Software Architects

You will be responsible for identifying, researching and designing innovative software products which intelligently manage StorageTek's hierarchy of storage products.

Ideal candidate will have a BS/MS in CS and a minimum of ten years experience in software for the MVS/VM marketplace.

MVS and VM Software Engineers

You will be responsible for the design and implementation of advanced storage management software products to run on IBM mainframes.

Ideal candidates will have a BS or MS in CS or equivalent, plus experience with IBM/370 assembler language coding and knowledge in MVS and/or VM internals. Openings exist at all levels.

At StorageTek you'll enjoy the stimulation of working with the top-flight technical talent in the business. If you thrive in a systems software development environment, you'll warm to our climate, culture and unlimited recreational activities. That's the beauty of StorageTek in Colorado.

For immediate consideration, please send your resume to David Armstead, Department CW79, Storage Technology Corporation, 2270 South 88th St., Louisville, Colorado 80028-4199.
We are an equal opportunity employer.

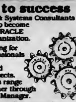
StorageTek

The Information Storage and Retrieval Company

Physicist/CAD Specialist. Responsible for conducting research and interpretation of ferro-electric memory development (FERRAM Memory) using computer-aided design tools to develop the manner in which ferro-electric memory is to perform. Apply the laws and theories of physics to develop models suitable for use with the SPICE simulation package and integrate these models into Fortran language. The purpose of integrating the models into Fortran language is to allow the design of the FERRAM Memory. Install, develop and maintain software packages for layout verification of FERRAM Memory integrated circuits, particularly using SUN hardware under the UNIX operating system. Minimum requirements: B.S. in Physics or Applied Physics; 3 years experience in Computer Aided Design/Layout Verification; Working knowledge of model installation in SPICE simulation package using Fortran language; Working knowledge of SUN hardware platform. $47,000/year. 40 hr. week. Apply by resume to Colorado Department of Labor and Employment, [illegible] Grant Street, Suite 900, Denver, CO 80203. Refer to Job order #CO [illegible].

Geared to success

Programming & Systems Consultants is gearing up to become the premier ORACLE consulting organization.



We are searching for ORACLE professionals who thrive on challenging and interesting projects. These positions range from Programmer through DBA to Project Manager.

If you are seeking the opportunity to gear-up your career, Programming & Systems Consultants is the firm for you. And, if you possess the unique blend of outstanding technical talent and interpersonal skills we want to talk to you.

We offer outstanding rewards for excellent performance.

Call David Graziano - Vice President of Recruiting to find out more.

Programming & Systems Consultants
443 N. New Ballas Rd. Suite 250
St. Louis, MO 63141
(314) 567-1396

ORACLE is a registered trademark of Oracle Corporation

WESSON, TAYLOR, WELLS

Wesson, Taylor, Wells, a contract/consulting firm has multiple opportunities for both hourly and salaried individuals with:

HP-3000	IBM
TRANSACT	DB-II
POWERHOUSE	SQL
SPEEDWARE	TELON
MM/3000	PC FOCUS
PROTOS	PL-1
COBOL	IMS

DEC VAX

ORACLE/SQL
FOCUS
RDB
DECNET/FORTRAN

Send your resume to: P.O. Box 1587, Camden, S.C. 29020. Attn: Keith McCartney 1-800-[illegible]-4463

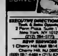
RESEARCH STAFF MEMBER (Westchester Cty, NY): Conduct research in theory of math statistics, including [illegible] of methods for characterizing the distributions of classes of random variables for describing samples, & for estimating parameters of distribution functions. Involves applications in data analysis in hydrology, reliability & business forecasting. PhD in statistics + one yr in job or one yr as [illegible] in math statistics req'd. One yr exp must include techniques of appl'd statistics & comp sci. Position requires originality in methods proposed, in mathematical & computational schemes for proving the value of these methods, & in graphical display of results. Must be able to communicate results of work for technical presentations & publications. Resch exp only be obtained at grad or post-doc level. 40 hrs/wk; 8:30am-5:12pm; $62,000/yr; EOE. Send resume or letter, IN DUPLICATE, describing qualifications to PAM#[illegible], Room 801, One Main St, Brooklyn, NY 11201.

Research & Development

Multiple positions are available for experienced, self-motivated professionals at our *Miami Florida* office. Leading edge technology is being developed now and you may be qualified to participate.

Applicants must have heavy C experience (MS-DOS or UNIX), project management, Database design (DataFlex preferred). Communications and/or user interface specialty. Positions also available in technical services. Resumes only please.

Data Access Corporation
14000 SW 119 Ave. Miami, FL 33186



FREE 1988 Computer SALARY SURVEY

EXECUTIVE DIRECTIONS, INC.
Tech. & Sales Openings
2 Penn Plaza, Suite 1185
New York, NY 10121
(212) 394-5775

RSVP SERVICES
1 Cherry Hill Mall [illegible]14 (C1)
Cherry Hill, NJ 08002
(609) [illegible]-4488 • (215) 629-[illegible]

FLORIDA

Project Leader $30,000

Syst38, RPG III BKGD. Exp in Manufacturing or Financial Systems Design. MAPICS exp Big Plus.

Russell Warner Associates
[illegible] North Lois Ave.
Suite 100
Tampa, FL 33607
(813) 876-[illegible]

Computer Science

LEAD SYSTEMS PROGRAMMER

Position with the City of Colorado Springs responsible for coordinating system software installation on IBM mainframe. Plan, coordinate, and monitor the tasks of systems programmers. Coordinates strategies and plans to implement system software and participates in testing and implementation. MUST HAVE: Bachelor's degree, preferably in Computer Science or Management Information Systems; four years of progressively responsible systems programming experience involving the use of IBM mainframe systems and (MVS) in the installation and update of computer operating systems and utilities; or an equivalent combination of education and experience. DESIRABLE: Knowledge of SMP/E, work in a multi-vendor environment, working knowledge of Panvalet, Easytrieve, and Omegamon.

SALARY: $2,772 - $3,210 per month.

A City application is required and may be obtained by contacting 719-578-6486. The application must state position title/code and be received by Friday, May 27, 1988, in the City of Colorado Springs, Department of Personnel, Attention: Position No. W-2200, Post Office Box 1575, 30 South Nevada Avenue, Suite 105, Colorado Springs, Colorado 80901-1575. Application Office Hours are 8 a.m. to 5 p.m. Monday, Wednesday, and Friday. We Are An Equal Opportunity Affirmative Action Employer.

SOFTWARE SYSTEMS ANALYST

University of Nevada System Computing Services
Southern Facility
Las Vegas, Nevada

Under supervision of the Senior Software Systems Analyst, this position will provide on-call backup for the Senior Software Systems Analyst in all phases of software support, install, maintain, and document third party application software, follow software modifications and documentation standards, provide technical assistance on software questions.

SALARY: up to $25,872

APPLICATION DEADLINE: JUNE 30, 1988

STARTING DATE: on or before September 1, 1988

The minimal requirements for the successful candidate are:

- B.S. degree in computer-related field or a Bachelor's degree and experience with timesharing computing.
- good written and oral English communication skills.
- ability to work with diverse individuals in a tactful, productive manner.
- demonstrated in-depth knowledge of at least one of the following languages: C, PASCAL, FORTRAN, MODULA II or ADA.
- demonstrated in-depth knowledge of common computer data structures (lists, trees, queues, etc.).

Additional qualifications to help identify a desirable candidate:

- Experience with CDC NOS or NOS/VE or IBM VM/VSE operating systems.
- experience in an Academic Computing environment.
- experience as a systems programmer.
- knowledge of at least one of the following programming languages: Compass, Cobol or Cybil.

Please send letter of application and resume (including the name, address and phone number of at least three professional references) to:

Ms. Kathy White, UNS Computing Services, 4505 Maryland Parkway, Las Vegas, Nevada 89154

The University of Nevada System Computing Services provides a wide range of academic and administrative computing services statewide. Major facilities are maintained in both Reno and Las Vegas, including an extensive statewide communications network. Southern facility hardware includes a dual CDC/Cyber 830, two Harris H800's, a DEC/VAX 11/750 and a Sun 3/280.

THE UNIVERSITY OF NEVADA SYSTEM IS AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER. UNS EMPLOYS ONLY UNITED STATES CITIZENS AND ALIENS LAWFULLY AUTHORIZED TO WORK IN THE UNITED STATES.

Data Processing Professionals

SCT

THE SAVVY TO INTEGRATE SYSTEMS WITH DYNAMIC CAREERS

In just two decades, Systems & Computer Technology Corporation has become one of the leaders in providing systems integration and information services nationwide. Our expertise lies in providing these services in several key niche areas including higher education and local government. With new, innovative software and information resource management services being introduced, we're in a position to offer our data processing professionals unequalled diversity, challenges and rewards.

We're currently seeking the following individuals with the drive and experience to join us at our suburban Philadelphia headquarters and at more than 40 locations nationwide.

• **SITE DIRECTORS**—Direct entire data processing and computing activity for client data center including administrative systems analysis, programming and processing, computing support, technical support, data preparation and equipment operation. Overall responsibility for client interface, facility management and profit and loss.

• **TECHNICAL DIRECTORS**—Responsible for project and budgetary coordination. Will direct staff in planning and initiating adminstrative programs. Must have experience in technical management of data processing operations.

• **SYSTEMS & PROGRAMMING MANAGERS**—Will plan and direct programming and systems staff. Requirements include experience in the design of systems and database structures.

• **COMPUTER OPERATIONS MANAGER**—Requires large scale IBM or DEC systems experience.

• **SYSTEMS PROGRAMMERS**—MVS/XA, VM/CMS, DOS/VSE or VAX VMS.

• **PROGRAMMER ANALYSTS**—ORACLE/SQL, IDMS-R/ADSO, COBOL/CICS, ADABAS/NATURAL.

In addition to competitive starting salaries and excellent benefits, you'll have the opportunity to apply your skills with one of the most unique and dynamic companies in the industry. Send your resume with salary history/requirements or call: **Recruiting Manager, (800) 441-7247, SCT, Great Valley Corp. Center, 4 Country View Road, Malvern, PA 19355.** An Equal Opportunity Employer M/F.

The Systems Integrator

MANAGER OF TECHNICAL TRAINING

Up to $60K

Fannie Mae, one of the nation's largest corporations, has an immediate opportunity for an experienced Manager to lead a team of instructors to design and implement our corporate technical training strategy. This requires the ability to manage the development of in-house courses, as well as the evaluation and selection of vendor-supplied courses. These programs are used to develop and enhance the skill of the computer operators, programmers and analysts in our 600-person technology organization across the nation.

You will be responsible for determining corporate training needs, setting training objectives with senior management, and designing programs and establishing performance criteria. The ideal candidate will have at least 5 years' IBM Mainframe experience with teaching experience in TSO, ISPF/PDF, JCL, utilities, and COBOL. Knowledge of data base management packages, MVS concepts, systems analysis, and project management techniques is preferred. PC training experience is also helpful.

This is a high visibility position with a very competitive salary and benefits package. For immediate consideration, please send your resume in confidence to: FANNIE MAE, Attn: Asst. VP for Human Resources, Dept. SW0198, P.O. Box 39206, Washington, D.C. 20016

Fannie Mae is an Affirmative Action/Equal Opportunity Employer. We invite inquiries and applications from minorities, women, and members of protected groups.

FannieMae

RESEARCH STAFF MEMBER
(Westchester City, NY): Conduct research in field of natural language processing, involving basic research in semantics & practical adjunct of a grammar-checking computer system. Includes linguistic search of grammatical & stylistic errors made by both native & non-native speakers of English & implementation of rules to check such errors. Search includes proposing + evaluating innovative techniques for representation & processing of semantic information, as it is found in standard dictionaries, for incorporation of this information into a practical grammar-checking system. Must be able to effectively communicate results of work for publication &/or presentation. PhD in linguistics + one yr in job or one yr as reserchr in natural language semantics req'd. One year exp must include linguistics as app'd to the structure of English (especially as related to detecting & correcting errors in written English), & in lexical semantics & predicate logic. Must have published on relevant topics. Search exp may be obtained at grad or post-doc level. 40 hr/wk; 8:30am-5:12pm, $60,000/yr; EOE. Send resume or letter, IN DUPLICATE, describing qualifications to: RG-#280, Rosh 501, One Main St, Brooklyn, NY 11201

EXECUTIVE POSITION

HQ Air Force Communications Command is seeking a dynamic and innovative Information Systems professional to serve as a Director, Air Force Communications and Computer Systems Integration Office.

Ideal candidate has proven experience in managing total integration of complex communications and computer systems with long term implementation vision.

Salary $65,904 to $73,400 pa.

For application information, write to:

Jo Ann Berry, 375 ABG/DPCS, Scott AFB IL 62225-5865, or call (618) 256-2530.

Equal Opportunity Employer

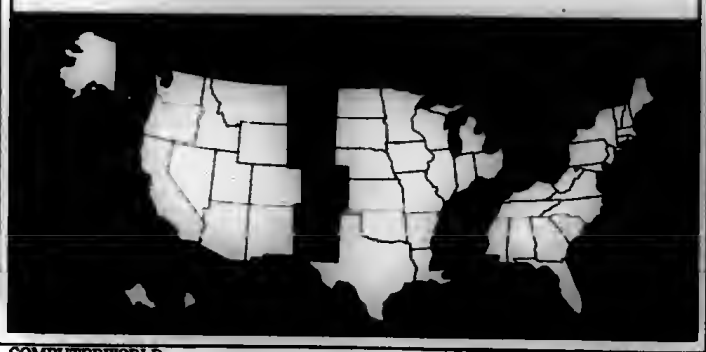
Weekly. Regional. National. And it works!

Just four reasons why more companies run more recruitment advertising in *Computerworld* than in any other specialized business newspaper.

For more information or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 617-879-0700).

Weekly. Regional. National. And it works.

An IDG Communications Publication



MARKETPLACE

Comdex: Christmas in May

IBM, Apple users scour exhibition floors for hardware, software news

BY CAMERON HALL
BOSTON COMPUTER EXCHANGE CORP.

The market was like a roller coaster during the week ended May 6, with traders frantic on the telephones and hectic trading dominating the Big Board. Concerns about releases at Comdex/Spring '88 were present for sellers; their machines might lose value in the face of new competition presented at the show.

Buyers normally active in the IBM Personal Computer XT- and PC AT-based market put off purchases during the week. Some were waiting for announcements of upgraded Intel Corp. 80286 and 80386 boards and hoping new releases will result in increased performance for their machines or in price drops on the DOS 3.4 features. This DOS upgrade would extend the productive life of first-generation machines for users who need expanded and extended memory and high-capacity hard-disk access.

The upgrade is particularly valuable to companies with a large installed base of XTs and ATs that have yet to plan a transition to IBM's Personal System/2. PS/2 buyers also seemed excited by anticipated expansion boards for their machines and by IBM's showcase of OS/2 applications.

Apple Computer, Inc. Macintosh buyers looked forward to new and enhanced hardware and software at Comdex, with Mac SE buyers confident that they were in line for all new products, and Macintosh Plus buyers hoping that items on their wish lists would be applicable in the Mac Plus environment.

Computer-aided design and manufacturing users currently using minicomputers and PCs sought Mac II prices to have in hand as they shopped the floors of Comdex for better graphics and color.

IBM: Ups and downs

On the IBM floor, the PC AT Model 339 held steady at the previous week's price of $3,550, and the AT Model 239 was up $50 to close at $2,650. The PC XT Model 089 was down $25 to $1,625 as Comdex fever brought sellers to the market, the XT Model 086 closed at $1,225, up $40 under favorable conditions. The standard IBM PC held at $800, and PS/2s traded at last week's close.

The Compaq Computer Corp. market was up, with the most active Compaq Portable I trading up $25 to $825, the Compaq Plus up $25 to $1,150, still a bargain when compared with a 10-MHz IBM PC XT trading at $1,225. The Portable II was up $100 to $2,200 as buyers sought bargains in the 286 market, and the Portable 286 also up $25 to $2,175.

In the desktop market, the 20-MHz Deskpro drew buyers in price wars with the IBM XT Model 089 and closed up $50 at $1,450. The Deskpro 286 and 386 sold at last week's prices.

The volume trader in the Apple Macintosh market was the Macintosh 512, keeping its place in the market at last week's close of $750, and the active Mac 512E was up $50 to $925. Mac Plus and SE buyers traded with unchanged price levels. Mac II buyers, confident of their direction, bid up the Mac II prices $50 to $4,025.

Going to Oz

One savvy market participant noted, "The Mac II is the machine of the future, and I'm on its yellow brick road."

With the PS/2 about to come into its first major price break, the older machines — particularly the XTs — are two generations away from the leading edge of the market. The old wisdom in the secondary market is that the best time to sell is when a second generation has replaced the earlier equipment.

While there is probably a floor for every era of microcomputer under which it will not fall — like the proverbial $500 Volkswagen — there is also a time when it is ripe to dispose of old hardware; a time when it is optimal to sell.

The Boston Computer Exchange can be reached at 800-BOCOEXX or 617-542-4414 in Massachusetts.

The BoCoEx Index

Closing prices report for the week ending May 6, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	$800	$900	$525
XT Model 086	$1,225	$1,350	$900
XT Model 089	$1,625	$1,725	$1,125
AT Model 099	$2,350	$2,425	$1,750
AT Model 239	$2,650	$2,650	$2,125
AT Model 339	$3,550	$3,700	$2,675
PS/2 Model 50	$2,300	$2,475	$2,225
PS/2 Model 80	$5,800	$6,100	$5,275
Compaq Portable I	$825	$900	$525
Portable II	$2,200	$2,200	$1,600
Portable III	$3,200	$3,250	$2,700
Portable 286	$2,175	$2,250	$1,675
Plus	$1,150	$1,175	$750
Deskpro 20-MHz	$1,450	$1,500	$975
Deskpro 286	$2,425	$2,475	$1,825
Deskpro 386	$4,075	$4,000	$3,475
Apple Macintosh 512	$750	$800	$575
512E	$925	$1,025	$650
Plus	$1,150	$1,350	$850
Plus 20-MHz	$1,750	$1,800	$1,450
SE	$1,925	$2,200	$1,800
SE 20-MHz	$2,400	$2,450	$2,050
II	$4,025	$4,325	$3,500
Apple Laserwriter Plus	$3,125	$3,400	$2,450
HP Laserjet Series 2	$1,400	$1,425	$1,300
NEC Multispeed EL	$950	$950	$675

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

Used Equipment

We Buy, Sell & Rent
Used VAX/VMS Systems & Parts
Overseas Inquiries Welcome
Please Call Collect
Used [redacted] Spares
VS 85/90/100 1 MB Memory Board $1995
OS 50 3495
128K Memory Board (2200) 495
VS15 & VS65 Users: 147MB Disk-Drive (Wang upgrade – UU3298) 3995
2236 MXE (2300) 550
2265 V-2 (299 MB) Disk Drive 4495
VS5 & VS6 Users: 67MB Disk Drive (Wang upgrade – UU3440) 3495
Nerbonnes Ltd.
34 Peachy Unit 17
Concord, ON L4K 1S6
(416) 738-8808
Telex: 06-966551 Fax: (416) 738-8013

DEC VAX & PDP 11
BUY-SELL-NEW-USED
Systems, Peripherals, Options available for sale
Looking to purchase VAX and PDP 11 Systems, Hardware
LAKEWOOD COMPUTER CORP.
438 Link Lane
Ft. Collins, CO 80524
(303) 493-6406 FAX: (303) 493-6409
dda

HONEYWELL

IBM SPECIALISTS
800 251 26
CMA
COMPUTER MARKETING
PO BOX 71 • 810 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

NCR 8575
FOR SALE
Upgrading system/must let NCR system go at low, low price.
NCR 8575, plus 6550 & 658 disk drives, tapes, card reader & console, etc.
CALL: Chuck Hayes at (208) 395-5812

DATA GENERAL
digital IBM
BUY, SELL, LEASE, TRADE
Systems, CPU's, Disk Drives, Memory, Printers, Communications
PC RENTALS & RENT-TO-BUY
Add FAX TO YOUR PC $499
AMES SCIENCES, INC.
(201) 476-3200
FAX (201) 476-3300

Your Advertisement For:
• Used Equipment • Hardware • Bids & Proposals • Financial Services • Training • Supplies • Time & Services • Software • Communications • Rental & Leasing
can appear here... in Computerworld MARKETPLACE
East/(201) 867-1300 West/(617) 655-7739
Northeast/(617) 655-7704 Midwest/(617) 655-7739

Used Equipment

We've Got You Covered

Small To Mid-Size Systems

- S/36, S/38, 9370, SILVERLAKE
- All Upgrades & Peripherals
- Customized Leasing Packages
- Lease, Buy, Or Sell
- Immediate Delivery
- Buy-Back Program
- Equipment Refurbished & Maintenance Guaranteed
- Technical Systems Support
- Distributor For Memorex, LOCOM, & EMC²

NEPTUNE
MARSHALL LEWIS DIVISION

For Small To Mid-Size Systems Call
1-800-426-8733 (714) 641-0366 (In CA)

Large Systems

- 4381, 308X, 3090
- Non-IBM (Amdahl, NAS & More)
- Peripherals & Communication Equipment
- Customized Leasing Packages
- Mid-Lease CPU & DASD Upgrades
- Lease, Buy, Or Sell
- Immediate Delivery
- Equipment Refurbished & Maintenance Guaranteed

NEPTUNE
For Large Systems Call (203) 356-9282!

IBM, Memorex, LOCOM, & EMC² are registered trademarks of International Business Machines Corporation, Memorex Corporation, LOCOM Corporation and EMC² Corporation respectively

---

PRIME

EXPERIENCED SYSTEMS AND PERIPHERALS

BUY-SELL-LEASE-BROKERAGE

NEW PLUG-COMPATIBLE DISK, TAPE, MEMORY

PLUS
THE FASTEST I/O AVAILABLE ANYWHERE

1ST SOLUTIONS, INC
11400 N CAVE CREEK ROAD
PHOENIX, AZ 85020
602-997-0007
ASK FOR DON SHIFRIS

IF YOU'RE BUYING, WE'RE SELLING

IF YOU'RE SELLING, WE'RE BUYING

IBM SYSTEMS
Buy • Sell • Lease PERIPHERALS

(800) 331-8283
TOLL FREE

(213) 308-8343
CALIFORNIA

Ocean Computers, Inc.
8055 W. Manchester Ave. Ste 525
Playa Del Rey, CA 90293

IBM BUY · SELL · LEASE

36 · 38 · 4300 · SERIES 1

MISSISSIPPI CENTRAL
DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

Request for Proposal No. 1986, due Tuesday, July 12, 1988 at 3:30 p.m. for the acquisition of a financial management system for implementation within an Amdahl 5860 host and distributed networking environment under MVS/XA to serve the agencies of MISSISSIPPI STATE GOVERNMENT. Vendors are required by the specifications to attend a mandatory bidder's conference prior to submitting bids. BIDS FROM VENDORS NOT ATTENDING THE MANDATORY BIDDER'S CONFERENCE WILL NOT BE CONSIDERED. Charge $10.00.

Request for Proposal No. 1987, due Tuesday, May 31, 1988 at 3:30 p.m. for the acquisition of an IBM System/36 minicomputer or compatible equivalent for MISSISSIPPI VALLEY STATE UNIVERSITY. No Charge.

Request for Proposal No. 1988, due Tuesday, May 31, 1988 at 3:30 p.m. for the acquisition of laboratory software to run on a Data General MV/5000 for the UNIVERSITY OF MISSISSIPPI MEDICAL CENTER. No charge.

Request for Proposal No. 1989, due Wednesday, June 1, 1988 at 3:30 p.m. for the acquisition of four local area networks for the OFFICE OF THE STATE AUDITOR. Charge $10.00.

Detailed specifications may be obtained free of charge from the CDPA office or at the specified cost by submitting a written request accompanied by the appropriate payment. NOTE: Valid forms of payment are corporate check on a Mississippi bank, certified check or POSTAL money order. NO CASH OR OUT-OF-STATE CHECKS. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ (601) 359-2604

WANTED

OBSOLETE COMPUTER EQUIPMENT

Top Cash Paid

We purchase all types of obsolete or excess computer equipment and peripherals. We pay costs for all shipments as well as top prices.

Call today for a quote on your system.

COMPU-SCRAP, Inc.
Randolph, MA 02368
(617) 341-2695
Call Collect!

BUY - SELL
BURROUGHS

All Processors, Printers
Tapes, Disks, Terminals

Competitively Priced

Immediate Delivery

Computer Equity Organization
(303) 825-2041

WANG

Buy • Sell
MVP/LVP • OIS
VS • PC
System in Inventory
VS-6, 65, 85, 100
OIS - 60,80
4230-A

GENESIS
EQUIPMENT MARKETING
GEM

602-277-6230

---

55 PAGE
4381
ANALYSIS

FREE
TO IBM USERS

marketex
SALES AND SUPPORT
800 426-4381
CA 408 241-3677

DEC PDP-11
SYSTEMS & PERIPHERALS

BUY & SELL

THE One-Stop EXCHANGE!
• CPUS • TERMINALS
• DISC DRIVES • PRINTERS
• INTERFACES, ETC.

DIGITAL COMPUTER EXCHANGE INC
27773 Industrial Blvd. Hayward, CA 94545
FAX (415) 887-6555 TLX 705555

Call (415) 887-3100

WANTED

- Used 2400ft Magnetic Tape 2,000 - 100,000 Reels
  - Will Pick Up At Your Location
  - Will DeGauze And Pay Freight
- Used 200 and 300 Meg Disk Packs

Please call
Lenny Rodgers
(407) 628-2141

the Supplyline

4341 - 4381

Buy - Sell - Lease
Trade-in

Systems and Peripherals

Hawkes Bay Computer
(408) 866-1020

Used Equipment

BUY OR SELL NEW OR USED

IBM PC * XT * AT * PS/2
COMPAQ * HP * AT&T * WANG
MACINTOSH * APPLE 2

1-800-262-6399

Boston Computer Exchange Corporation
MA 617-542-4414
FAX 617-542-8849

WANG
PRIME
MICRODATA
HONEYWELL
HEWLETT-PACKARD

CRC

BUY, SELL, LEASE, TRADE

23950 Commerce Park, Beachwood, Ohio 44122
(216) 292-0635 Fax: 216-292-4838 Telex: 205129

CRC is a Trademark of Computer Remarketing Corporations

Get the Fax.

digital

FOR SALE!

865 XBAE
DEC NET VMS
IMMEDIATE DELIVERY
$290,000

SA 482
NEW
$58,900

VT241-AA
VT24K-AA
NEW
$1,850

VT320-CA
NEW
$470

DHU11-M
CK-DHU11
$3050

8500, 8700 SERIES
F1007
DECODER MODULE
NEW $29,495

CDLA Member

Merida Trading Group
4C Gill Street
Woburn, MA 01801

dda
DIGITAL DEALERS ASSOCIATION

Merida...
service is our strongest suit!
(617) 933-6790
FAX 617-933-7884

Digital and DEC are registered trademarks of Digital Equipment Corp.

SALE
OR
LEASE
IBM CPUs

3084 - Q64	NOW
3090 - 150	3/1/88
3081 - GX2	NOW

Call:
GTEX Financial Group
(214) 783-1212

FOR SALE

1	Honeywell	DPS6/64
4	Honeywell	Level 6/53
31	Honeywell	7801 Terminals
7	Honeywell	7803 Terminals
47	Honeywell	7813 Terminals
54	Honeywell	7308 Terminals
19	Honeywell	PRU7004 Printers
8	Honeywell	PRU7170 Printers
1	Honeywell	PRU7075 Printers
100	Phoenix	Disc Cartridges

For additional information contact:
Mr. J. Pugliano at
(412) 237-3024
by May 27, 1988.
Sealed bids are due on June 10, 1988.

FOR SALE
NIXDORF 8870 COMPUTER
Model 45
Multiuser mini
132MB Disk
(Including 6 Terminals, 1 system printer, 2 terminal printers)
System designed to run Nixdorf's COBET and LMS Software Applications. Programming language - Business Basic.
Best Offer
Call Peter Kortemeyer
(804) 233-5300

Available Immediately
XEROX 860 Word Processing Equipment
Various Configurations
- *Ethernet Interface*
- *Impact Printers*
- *Software and Documentation*

Call Karen Bender
(800) 225-7632 x426
(617) 267-6410 x426

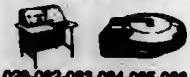
FOR LEASE
IBM EQUIPMENT
3084 - QX8/QX9
3090 - 300E
3090 - 400E
Also
3380 - AA4 - B04
We provide leasing on all types of equipment
Call
SmithWilson
312-541-2000
FAX 312-541-4844
CDLA

MEMORY BOARDS WANTED!
Any Type, Any Condition, Any Quantity
TOP PRICES PAID
COMPU-SCRAP
Call Collect
617-341-2695

Used Equipment

IBM Unit Record Equipment

Data Modules/Disk Packs
Magnetic Tape/Diskettes



029-082-083-084-085-086
129-514-519-548-557-188

2316-3336(1)&(11)-3348(70)
80-200-300 MB
Disk Packs

Thomas Computer Corp.
[illegible]
[illegible] 312-647-[illegible]

Reconditioned Digital Equipment and Peripherals

Whatever your requirements are for Digital Equipment, call CSI! ever Buying, selling, trading, leasing, consignments - we do it all!

CSI sells all equipment with a 30 day unconditional guarantee on parts and labor and is eligible for DEC maintenance.

Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many more.

CSI Comparex Systems, Inc.
One Cabot Place, Stoughton, MA 02072
In Mass. (617) 344-0888
FAX (617) 344-4188
Call toll-free 1-800-[illegible]

BUY SELL & LEASE

IBM System
34 • 36 • 38
4300

Oakland Computer Services
P.O. Box 1144
S. Lancaster, MA 01561
800-544-2275

HP 3000

7933H
Available in Quantity
Processors • Peripherals
Systems
All In Stock - Immediate Delivery
All warranted to qualify for manufacturer's maintenance
BUY • SELL • TRADE
RENT • LEASE
ConAm Corporation
It's Performance That Counts!
800/643-4954 213/629-2277

$ SAVE $
IBM
DISPLAYWRITERS
FEATURES & UPGRADES

BUY - SELL - LEASE
IBM
4381
ASK FOR MIKE DEXLER
New York Systems Exchange
Melville, New York
CDLA
Area Code: 516
673-3830

You Have 10 Ways To Advertise Your Products In The MARKETPLACE

It's Computerworld's Product Classified *MARKETPLACE*

Featuring:

- ☐ Used Equipment
- ☐ Software
- ☐ Rental & Leasing
- ☐ Supplies
- ☐ Training
- ☐ Hardware
- ☐ Communications Equipment
- ☐ Time & Services
- ☐ Bids & Proposals
- ☐ Financial Business Services

Reach over 612,000 Information Systems Professionals by placing your ad in the MARKETPLACE.

Name: _____
Title: _____
Company: _____
Address: _____
City: _____
State: _____ Zip: _____

☐ I am enclosing ad material with this form.

Ad size:
_____ columns wide x _____ inches deep.

Return this form and advertising material to:
Computerworld Product Classified
Marketplace
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171
or call a representative today for all the details:
(201) 967-1358
(617) 879-0700

Time & Services

How to increase your power without paying the price.

Turn to Manufacturers Hanover Data Services Corporation for low-cost, state-of-the-art timesharing and information Center services

- Secure environment
- Software includes MVS/SP, VM/SP, VM/XA, TSO, GDDM, CMS, and Presentation Graphics Equipment
- Processing done on IBM 3084 MX3 and IBM 4381 systems
- Accessible via many telecommunications methods
- Volume discounts

For more information write:
Jeff Daum
Manufacturers Hanover Data Services Corporation
P.O. Box 26
Carlstadt, New Jersey 07072

Or call (201) 896-2030

MANUFACTURERS HANOVER

IBM is a trademark of International Business Machines Corporation.

© 1987 Manufacturers Hanover Trust

COMPUTING SERVICES

MVS/XA VM/370 DOS/VSE
CICS TSO CMS
DB2 IMS/DBDC 4GL SAS

MULTIPLE CPUs -
50+ MIPS

TELENET, TYMNET
IBM INFORMATION NETWORK

DEDICATED SYSTEMS AVAILABLE

GIS
INFORMATION SYSTEMS, INC.
815 COMMERCE DRIVE
OAK BROOK, IL 60521
312-574-3638

TIMESHARE

MVS - VM - DOS

- Save 25% on current charges
- Full Service - 24 Hours
- Laser Printing
- Data Entry
- All Communications
- Tymnet - XCOM 6.2

Call: Ted Moulder
1-800-422-3220

STAFTAB Established 1936

COMPUTING SERVICES

COMMERCIAL ON-LINE SYSTEMS INC.

IBM 4381-13
TSO/ISPF

- Batch Processing
- Time Sharing
- Data Entry
- Volume Discount
- Terminals & Desk Space

Call
Jack Platt
212-564-3730
Mid-town Location

COMPUTER TIME DEDICATED CPU (4341-2)

With peripherals
Convenient NJ location

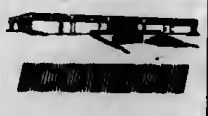
$65. per wall-clock hour (4 hour minimum)

Call
Dennis Shedlock
(201) 548-5800

COMPUTER TIMESHARING

- We broker computer time.
- We find your lowest prices
- Nationwide service since 1981.
- All mainframes.
- NEVER a charge to the Buyer.
- Our fees paid by the Seller.

Call Don Seiden at
Computer Reserves, Inc.
(201) 668-6100



Innovative Computer Technologies

COMPUTER SERVICES
IBM 3084

- Batch Processing • Public Network Access
- Timesharing • Laser Printing

Route 202, Raritan, N.J. 08869
201-685-3400
Contact: Joyce Bogsanko

We Share

We offer Mainframe computing services:

IBM
308X, MVS/XA, CICS, TSO, VM

DATABASE
ADABAS/NATURAL, DB2

VAX VMS
HP MPE/V

We make your job easier by offering:
■ Nationwide Data Access ■ Volume Discounts ■ High Speed Laser or Impact Printing ■ Mailing Services

1-800-654-9347

Weyerhaeuser Information Systems

Peripheral Equipment

AIR HOVER
PORTABLE
REFRIGERATED AIR

AVAILABLE SIZES
1-5 TONS

- AIR COOLED (no water necessary)
- 1 TON PLUGS INTO 110 VOLT OUTLET
- THERMOSTATIC CONTROL
- HOT GAS BYPASS (11,000 - 60,000 BTU'S)
- PORTABLE - ROLLS THROUGH STANDARD DOOR OPENINGS

IDEAL FOR
- COMPUTER ROOMS • PBX and ELECTRONIC EQUIPMENT ROOMS
- OFFICES • FACTORIES and
- REMOTE LOCATIONS

GREAT FOR
AFTER HOUR, WEEKEND, SUPPLEMENTARY and EMERGENCY COOLING

AIR HOVER
1 (214) 677-3430
or FAX 1 (214) 677-2793

612,000

MIS/DP Professionals see the *MARKETPLACE* each week
Call for advertising information:

(201) 967-1358 (617) 879-0700

Bids & Proposals

METROPOLITAN TRANSPORTATION AUTHORITY NOTICE is hereby given that the Metropolitan Transportation Authority (MTA) will receive Technical Information pertaining to a third party computer and office automation maintenance services as indicated below. The technical information received in response to this RFI may be used to prepare a Request for Proposal at a later date or may be used to select a supplier. Request for Information may be secured from Donald C. Nell, Manager of Contracts, Metropolitan Transportation Authority, 347 Madison Avenue, New York, N.Y. 10017.

RFI NO.	DATE	TIME
9-01-88219-0	May 25/88	3PM

FOR: Third party maintenance services for IBM and Wang DP hardware, small systems and peripheral equipment.

NEW YORK STATE HIGHER EDUCATION SERVICES CORPORATION REQUEST FOR PROPOSAL

The corporation requests proposals from qualified firms to provide consultants to perform computer programming services on our Honeywell and IBM mainframe computer systems located at a site in Albany, NY.

Copies of the RFP will be available beginning May 16, 1988. Proposals must be submitted by June 20, 1988. Direct inquiries to Mr. John J. Wheeler, Administrative Officer, NYS HESC, 99 Washington Ave., Albany, NY 12255. (518) 473-1200.

FINANCIAL INFORMATION SERVICES AGENCY (FISA)
CITY OF NEW YORK

The City of New York, Financial Information Services Agency is seeking bids for off-site Data Entry Keying Services to begin July 1, 1988. Copies of the bid solicitation package may be obtained from FISA at 111 Eighth Avenue, 13th Floor, New York, N.Y. 10011. Attn: Adrienne R. Edley.

Information and dates regarding the pre-bid conference and the deadline for receipt of bids may be found within the bid solicitation package.

IBM 4341 MG2
8 Meg
Please Call
Anthony Panella
(802) 877-2911

The City of New York, Financial Information Services Agency is soliciting proposals for the following equipment:

1) Direct Access Storage Devices, single, double and triple density units.
2) Cartridge Tape Drive Subsystem.

Copies of the request for proposals with the specifications can be obtained from:

Financial Information Services Agency
111 Eighth Avenue, 13th Floor
New York, NY 10011
Attn: Harriet Chan King
(212) 206-3200 or 206-3062

Rental & Leasing

FOR RENT
IBM & COMPAQ
PC • XT • AT
Deskpro/Portable
1 Month - 3 Years
THE COMPUTER TRADERS
404-980-9233
FAX 404-951-2573

VAX RENTALS
MICROVAX II
VAX 700 SERIES
VAX 8000 SERIES
Systems & Peripherals
- Fast Turnaround
- Dependable Products
- Upgrade/Add-On Flexibility
- Purchase Option Available

3 Months • 6 Months • 12 Months

BROOKVALE ASSOCIATES
dcb Digital Dealers Association
(516) 275 7[illegible] (206) 392 3878

BURROUGHS UNISYS
B20 - B7000
A Series - V Series
All Peripherals
Low Lease Rates
Depot Maintenance
COMPUTER PROVISIONS CORPORATION
800-832-4664

21 MONTHS FREE!
Lease • Purchase
IBM System 36
Model 5362
2 Display Stations
Model 3179
4234 Printer
Used only 6 months!
Take over 3 years/3 months remaining on original 5 year lease/purchase. We are asking nothing for our equity, as we must change our data processing configuration by directive of our parent company.
(408) 298-8070

We Rent & Lease
DEC
Systems
Components
Digital Computer Resale
call:713 445-0062
609 Kenrick Ste C32
Houston, Tx 77060

Programmer Tools

FREE BUYER'S GUIDE

When you need programmer's development tools. Programmer's Connection is your best one-stop source. We are an independent dealer representing more than 200 manufacturers with over 600 software products for IBM personal computers and compatibles including: COBOL compilers and utilities relational databases and much more. Call today to receive a FREE comprehensive Buyer's Guide, and find out why Programmer's Connection is your best connection for software tools.

Programmer's Connection
7249 Whipple Ave NW
North Canton, Ohio 44720

800-336-1166 US

800-225-1166	Canada
216-494-3781 AK & OH (Collect)	
216-494-5260	FAX
9102406879	Telex
216-494-3781	International

Desk Top Publishing

"NOBODY"
We asked our customers to tell us who had LOWER PRICES than we did.
They told us ...

That's because we lead the industry both in price and quality in ½" 9-track tape drive subsystems to transfer information between mainframes and PC/XT/AT, PS2.

- *EBCDIC-ASCII Conversion*
- *Tape backup/volume data storage*
- *Transfer speeds up to 7 MEG/Min.*
- *Option to select and reject specific fields*
- *800/1600/6250 BPI*
- *Drives from Anritsu, Cipher, Qualstar and M4 Data*
- *Free technical support*

Dealer & Volume Discounts

FLAGSTAFF ENGINEERING
1120 Kaibab Lane • Flagstaff, AZ 86001
(602) 779-3341 • Telex 705609
FAX (602) 779-5998

Software

MIND OVER DOS
A NEW WORLD OF OPERATING SYSTEM EASE
COMPLETE MENU DRIVEN FUNCTIONS
- Transforms your directory into a menu and loads with one keystroke
- All DOS functions available
- Mind power Editor, a complete file management system with file merge capabilities and print commands
- View one or two directories on the same screen
- Open and edit one or two files on the same screen
- Copy from one file to another, a single character or a full file
- Mini word processor, Address directory
- All F keys functional
- Menu driven Help, Disk check
- Save to any drive

MANY MORE FEATURES
price - $79.95 per unit
Volume quote available.
Mind Software Systems
P.O. Box 280244
St. Louis, MO 63128-0244
(314) 961-1339

Real Estate

Data Center Available For Rent

Clifton, NJ, 1000 sq. ft. Computer Center with separate power and air conditioning plus 3100 sq. ft. office space. Available May 1988.

Call 201—890-7300

Hardware

USED S/38 WANTED

Private company is interested in directly purchasing a used system 38 for its own use. Any available model considered. Please respond to:

Information Systems Department
PO Box 17866
Anaheim, CA 92817

No Brokers Please

COMPUTERWORLD

Training Sections

Turn to the Training section of COMPUTERWORLD's issues for an interesting editorial feature addressing these and other questions.

5/23 The cost of setting up an inhouse training center. What do you need and how do you justify paying for it?

6/6 The advantages and disadvantages of teletraining. How costly and useful is it to broadcast instructor-lead sessions to remote locations?

6/20 Choosing a training consultant/vendor. Some criteria for making sure the person/company you hire can provide the services you need.

Call for more information
617-620-7794

COMPUTERWORLD

SALES OFFICES

Publisher/Fritz Landmann

Vice President/Associate Publisher/Val Landi, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700

BOSTON: Northern Regional Manager/David Peterson, District Managers/Bill Cadigan, Sherry Driscoll, Account Manager/John Watts, Sales Assistant/Alice Langley, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

CHICAGO: Eastern Regional Director/Bernie Hockswender, Midwest Regional Manager/Kevin McPherson, District Manager/Larry Craven, Sales Assistants/Kathy Sullivant, Karol Lange, COMPUTERWORLD, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433

NEW YORK: Eastern Regional Director/Bernie Hockswender, District Managers/Fred Lo Sapio, Frank Genovese, Sales Assistants/Mary Tagliaferri, Sue Larson, COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

LOS ANGELES: Western Regional Director/Mark V. Glasner, District Managers/Carolyn Knox, Darren R. Ford, Sales Assistant/Bev Raus, COMPUTERWORLD, 18004 Sky Park Circle, Suite 255, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO: Western Regional Director/Mark V. Glasner, Senior District Manager/Ernie Chamberlain, District Managers/Jan Harper, Michele O'Connor, Account Manager/Alice Saribalis, Sales Assistants/Christine Warfhorst, Robert Condensa, COMPUTERWORLD, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

ATLANTA: Eastern Regional Director/Bernie Hockswender, Southeastern Regional Manager/Kevin C. Harold, Account Manager/Melissa Christie, COMPUTERWORLD, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

DALLAS: Eastern Regional Director/Bernie Hockswender, Southeastern Regional Manager/Kevin C. Harold, COMPUTERWORLD, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882

WASHINGTON, D.C.: Eastern Regional Director/Bernie Hockswender, District Manager/Paula Smith, COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

PRODUCT CLASSIFIED ADVERTISING: Product Classified Advertising Director/Eastern Account Manager/Debbie Eisenberg, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

New England Account Manager/Paul Bonarrigo, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

Midwest Account Manager/Mary Campo, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

Western Account Manager/Karen Massimino, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

RECRUITMENT ADVERTISING: National Recruitment Sales Director/John Corrigan, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

RECRUITMENT ADVERTISING SALES OFFICES:
New England Recruitment Manager/Al DeMille, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

Mid-Atlantic Recruitment Manager/Warren Kolber, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

Midwest Recruitment Manager/Patricia Powers, O'Hare Corporate Tower One, 10400 West Higgins Road, Suite 300, Rosemont, IL 60019 (312) 827-4433

Western Recruitment Manager/Barbara Murphy, 18004 Skypark Circle, Suite 100, Irvine, CA 92714 (714) 250-0164

South-Atlantic Recruitment Manager/Kathryn Kress, 3022 Javier Road, Suite 210, Fairfax, VA 22031 (703) 573-4116

Recruitment Telemarketing Account Executives: New England/Nancy Percival, New York/Jay Novack, Mid-Atlantic/Pauline Smith, Midwest/Ellen Casey, Western/Chris Glenn, 1-800-343-6474 or (617) 879-0700

IDG INTERNATIONAL MARKETING SERVICES:
Managing Director/Frank Cutitta, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

West Coast Marketing Manager/Leslie Barner, 3350 West Bayshore Road, Suite 201, Palo Alto, CA 94303 (415) 424-1001

CW PUBLISHING/INC.

An IDG Communications Company

Fritz Landmann/President

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 617-879-0700, Telex: 95-1153, FAX: 617-879-8931

Vice President/Associate Publisher, Val Landi

OPERATIONS: Vice President/Operations, Matthew Smith, Business Manager, Mark Sullivan.

SALES: Advertising Director, Carolyn Novack, National Recruitment Sales Director, John Corrigan.
Display Advertising Production Manager, Maureen Carter, Product Classified Operations Director, Anne E. Hadley
Classified Operations Manager, Cynthia Delany

MARKETING: Vice President Marketing & Circulation, Jack Edmonston, Marketing Communications Director, Jan Bell.
Marketing Services Director, Audrey Shohan, Manager/Marketing Communications, Mary Doyle.

CIRCULATION: Vice President Marketing & Circulation, Jack Edmonston.
Director of Circulation Management, Maureen Burke, Director of Circulation Promotion, Jane Eyler.

PRODUCTION: Production Director, Leigh Horrath, Assistant Production Director, Carol Polack.
Production Manager, Beverly Wolff, Art Director, Tom Monahan.

FOREIGN EDITORIAL/SALES OFFICES

Argentina: Ruben Argento, CW Communicaciones S/A, Av Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: (011) 54 134-5583. Telex: (390) 22644 (BAZAN AR).

Asia: S.W. Chan, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (011) 852 5 861 3238. Telex: (780) 73627 (CWAWOR HX).

Australia: Alan Power, IDG Communications Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (011) 61 2 4395133. Telex: (790) AA74752 (COMWOR).

Austria: Manfred Weiss, CW Publikationen Verlagsgesellschaft m.b.H., Zieglergasse 6, A-1070 Wien, Austria. Phone: (011) 43-222-930600. Telex: (847) 115 542 (SCH/A).

Brazil: Ney Kruel, Computerworld do Brasil, Rua Alcindo Guanabara, 25-11 andar, 20.031 Rio de Janeiro, RJ Brazil. Phone: (011) 55 21 240 8225. Telex: (391) 21 30838.

Denmark: Preben Engell, Computerworld Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (011) 45 1955 685. Telex: (855) 31566.

France: Francois Chaussonniere, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: (011) 33 14 747 1272. Telex: (842) 613234 F

Hungary: Dezso Futasz, Computerworld Informatika Co., Ltd. H-1536 Budapest, Pf. 386, Hungary. Phone: (011) 36 1 226 458. Telex: (861) 22 6307 (CWI H).

Italy: Jean-Louis Redon, Computer Publishing Group S.R.L., Via Vida 7, 20127 Milano, Italy. Phone: (011) 39-2-2613432. Telex: (843) 335318.

Japan: Dick Yamashita, Computerworld Japan, Akasaka Omotemachi Bldg., Minato-ku, Tokyo 107. Phone: (011) 81 3 551 3882. Telex: (781) 252-4217 (Computerworld Japan only).

M. Nakamura, IDG Communications, Japan, c/o Marcom International, Inc., Akasaka Center Building, 1-3-12 Motoakasaka, Minato-ku, Tokyo 107, Japan. Phone: (011) 81 3 403-8519. Telex: (781) J27941 (reps for all CW Publishing publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld/Mexico S.A. de C.V., Oaxaca 21 2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (905) 514-4218 or 6308. Telex: (383) 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK Amsterdam, The Netherlands. Phone: (011) 31 20 646426. Telex: (844) 18242 (CWCOM NL).

New Zealand: Martin Taylor, Computerworld Communications Ltd., 2nd Floor, 15 Augustus Terrace, Parnell, Auckland, New Zealand. Phone: (011) 64-9-779-902. Fax: (011) 64 9 780 244

Norway: Morten Hansen, CW Norge A/S, Hovinveien 43, 0576, Oslo 5, Norway. Phone: (011) 472 647725. Telex: (856) 76476 (CW NOR N).

People's Republic of China: Chen Minghun, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Phone: (011) 47 814 6174. Telex: (716) 222214 (CCW CN).

Spain: Francisco Zabala, CW Communications, S.A., Rafael Calvo, 18, 4B, 28010 Madrid, Spain. Phone: (011) 34 1 419 4014. Telex: (831) 45522 (CW E).

Sweden: Bengt Marnfeldt, CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: (011) 46 8 67 81 80. Telex: (854) 14904 B (NOVACW)

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Witikonerstrasse no. 15, Postfach 253, CH - 8030 Zurich, Switzerland. Phone: (011) 41 1 55 10 77. Telex: (845) 816 710 (CWCI CH).

Taiwan: Leona Wang, ACE Media Agency Co. Ltd., P.O. Box 26-578 Taipei, Taiwan, R.O.C. Phone: (011) 02 751 3636. Telex: (785) 14142 (ACE GROUP). (Representative for all CWCI publications).

London: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (011) 44 1 831 9252. Telex: (851) 262346 (THEPUB G).

United Kingdom: Euan Rose, Beere Hobson & Associates, 34 Warwick Road, Kenilworth, Warwickshire, CV8 1HE, United Kingdom. Phone: (011) 09 26 512424. Telex: (851) 311951 (BEEHOB). (Representative for all CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.A L-Torre Maracaibo, Piso 13, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: (011) 58 2 72 76 30

West Germany: Eckhard Utpadel, CW Publikationen Verlagsgesellschaft mbH, Rheinstrasse 26/28, Postfach 40 0429, 8000 Munchen 40, West Germany. Phone: (011) 49 89 360860. Telex: (841) 5215350. (COMW D).

IDG COMMUNICATIONS/INC.

Patrick J. McGovern, Board Chairman — Axel Leblois, Chief Executive Officer — William P. Murphy, Vice President/Finance

Computerworld is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 90 computer publications in 33 countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the IDG News Service offering the latest on domestic and international computer news. IDG Communications publications include: ARGENTINA'S Computerworld Argentina; ASIA'S Communications World, Computerworld Hong Kong, Computerworld Southeast Asia, PC Review; AUSTRALIA'S Computerworld Australia, Communications World, Australian PC World, Australian Macworld; AUSTRIA'S Computerwelt Oesterreich; BRAZIL'S DataNews, PC Mundo, Micro Mundo; CANADA'S Computer Data; CHILE'S Informatica, Computacion Personal; DENMARK'S Computerworld Danmark, PC World Danmark, CAD/CAM World; FINLAND'S Mikro, Tietoviikko; FRANCE'S Le Monde Informatique, Distributique, InfoPC, Telecoms International; GREECE'S Computer Age; HUNGARY'S Computerworld SZT, PC Mikrovilag; INDIA'S Dataquest, PC World India; ISRAEL'S People & Computers Monthly, People & Computers Weekly, 3BM Monthly; ITALY'S Computerworld Italia; JAPAN'S Computerworld Japan, Semicon News; MEXICO'S Computerworld Mexico, PC Journal; THE NETHERLANDS' Computerworld Netherlands, PC World Benelux; NEW ZEALAND'S Computerworld New Zealand, Computerworld Norge, PC World Norge; PEOPLE'S REPUBLIC OF CHINA'S China Computerworld, China Computerworld Monthly; SAUDI ARABIA'S Arabian Computer News; SOUTH KOREA'S Computerworld Korea, PC World Korea; SPAIN'S Citrnworld, Computerworld Espana, Commodore World, PC World Espana, Comunicaciones World; SWEDEN'S Computer Sweden, MikroDatorn, Svenska PC World; SWITZERLAND'S Computerworld Schweiz; UNITED KINGDOM'S Computer News, ICL Today, Lotus, PC Business World; UNITED STATES' Amiga World, CD-ROM Review, CIO, Computer Currents, Computerworld, Digital News, Federal Computer Week, 80 Micro, Focus Publications, InCider, InfoWorld, Macintosh Today, Macworld, Computer + Software News (Micro Marketworld/Lebhar-Friedman), Network World, PC Letter, PC World, Portable Computer Review, Publish!, PC Resource, Run; VENEZUELA'S Computerworld Venezuela; WEST GERMANY'S Computerwoche, Information Management, PC Welt, PCWoche, Run/Run Specials.

ADVERTISERS INDEX

Advanced Computer Communication....42
Alcatel Business Systems.... 20-21
Amdahl EPS....70
American Management Systems 41
Apple Computer....66
Applied Software....64
Arthur Andersen.... 72-73
Ashton-Tate....97
AST Research.... 14-15

B.I. Moyle & Associates....25
BMC Software....28
Businessland....89

Computer Corp. of America.. 34-35
Chicago Soft....27
Chinon America....92
Cincom Systems....32
Codex.... 50-51
Cognos....22
Compaq Computer.... 16-17
Compuserve Data Technology41,43
Computer Associates....10
Computer Tech Group....69
Cullinet.... 62-63
CW Circulation....101
CW Customer Service....65
CW Marketplace....64,66,79,84

Data Base Management Inc. 65
Data Design Assoc....24
Data General....40

Exide Electronics....54

Gandalf....46
General Datacom.... 76-77

Harris Data Communications....100
Hayes Microcomputing.... 82-83

IBM....80
Information Dimensions.... 86-87
Innovation Data Processing....5
International Power Machines....56

Kolinar....15

Lawson Associates....30
Lotus....23

Mac Today....93
McCormack & Dodge....37
MCI....68
Micro Focus....31
Mitron Systems....36
Motorola.... 52-53
MSA....C4
Multi-Tech Systems....47

NCR.... 98-99
Netec....39
Network Equipment Technologies.... 58-59
Nynex....57,90

Onan....96
On-Line Software....60
Oracle....11

Plexus Computer....78/79

Realia....38

SAS Institute.... 12-13,67
Schumann Consulting....64
Software Engineering of America..9
Stratus Computer....C3
Sybase, Inc....29
Syncsort....3
Systems Industries.... 44-45

Tandem Computer.... 48-49
TBS Software....35
Texas Instruments....88
3Com Corporation.... 94-95
Tymnet.... 26-27

Universal Data Systems.... 74-75
Universal Software....78

VM Software....7

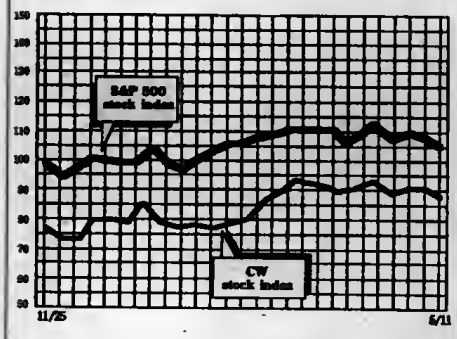
Wang....70/71,78

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Upcoming Computerworld Spotlight Sections

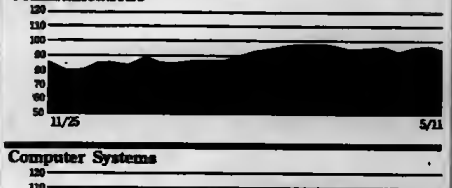
Issue Date	Topic	Ad Closing Date
June 6	CASE	May 20
June 20	The SNA Market	June 3
July 11	Disaster Prevention & Recovery Products & Services	June 24
July 25	Productivity Software	July 8
Aug. 8	TBA	July 22
Aug. 29	DB2 Market	Aug. 12
Sept. 19	Hardware Roundup: Large, Medium Scale and Special Purpose Systems	Sept. 2
Sept. 26	Hardware Roundup: Small Scale Systems	Sept. 9
Oct. 3	Hardware Roundup: Personal Computers and Workstations	Sept. 16
Oct. 17	AI/Expert Systems	Sept. 30
Oct. 31	Unix	Oct. 14

STOCK TRADING INDEX



Indexes	Last Week	This Week
Communications	97.4	93.4
Computer Systems	103.0	99.0
Software & DP Services	98.9	96.8
Semiconductors	69.3	65.6
Peripherals & Subsystems	88.1	84.0
Leasing Companies	116.3	113.7
Composite Index	91.0	87.6
S&P 500 Index	108.7	105.8

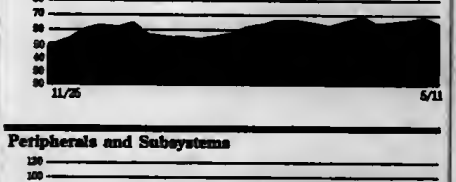
Communications



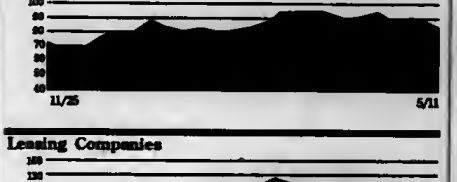
Computer Systems

Software and DP Services

Semiconductors



Peripherals and Subsystems



Leasing Companies

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MAY 11, 1988

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 11 1988	WEEK NET CHANGE	WEEK PCT CHANGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	120	74	85.75	-0.9	-1.0
Q	ANDREW CORP	18	11	16.00	0.3	1.7
Q	ARTEL COMM CORP	3	2	1.75	0.0	0.0
N	AT&T	36	20	26.88	0.8	1.5
Q	AVANT GARDE COMP INC	6	3	1.75	-0.5	-22.2
Q	AVANTEK INC	17	5	7.00	0.0	0.0
N	AYDIN CORP	35	15	20.00	-0.8	-0.8
N	BELL ATLANTIC CORP	30	61	65.63	-0.5	-1.3
N	BELLSOUTH CORP	44	35	38.63	0.0	0.0
Q	COMPRESSION LABS INC	5	3	3.63	-0.5	-12.1
Q	COMPUTER NETWORK TECH	5	1	1.22	-0.1	-7.2
Q	CONTEL CORP	40	25	31.88	-1.5	-4.8
Q	DATA SWITCH CORP	10	4	7.50	-0.8	-3.2
Q	DIGITAL COMM ASSOC	48	20	31.50	-2.1	-6.3
Q	DYNATECH CORP	33	14	31.25	-1.5	-4.8
Q	FIBRONICS INTERNATIONAL INC	7	3	3.00	-1.3	-39.4
Q	GANDALF TECHNOLOGIES	10	5	5.88	-0.1	-1.6
Q	GENERAL DATACOMM INDS	14	3	3.38	-0.5	-12.9
N	GTE CORP	45	35	35.25	-0.9	-1.4
Q	INFOTRON SYS CORP	13	6	11.50	0.3	2.2
N	ITT CORP	38	42	46.38	-2.4	-4.8
N	M/A COM INC	16	7	9.38	0.3	2.7
Q	MCI COMMUNICATIONS CORP	15	5	12.75	-0.8	-5.2
Q	COMM SYS INC	17	7	16.13	-1.0	-6.2
Q	NETWORK SYS CORP	13	7	6.75	-0.8	-8.8
N	NORTHERN TELECOM LTD	24	14	17.63	-0.4	-2.1
Q	NOVELL INC	20	13	31.50	0.8	1.2
N	NYNEX CORP	75	58	64.63	-1.1	-1.5
N	PACIFIC TELESIS GROUP	34	23	27.88	0.0	0.0
N	PARADYNE CORP	5	4	4.13	-0.8	-5.7
A	PENRIL CORP	5	1	4.63	-0.5	-9.8
N	PLESSEY PLC	40	23	29.00	-1.1	-3.7
N	SCIENTIFIC ATLANTA INC	20	8	13.75	-0.5	-3.5
N	SOUTHWESTERN BELL CORP	45	23	34.00	-0.5	-0.8
Q	3 COM CORP	29	12	19.25	-0.8	-4.8
N	TIMEPLEX INC	38	17	32.38	0.0	0.0
Q	UNGERMANN BASS INC	15	5	12.00	-0.1	-1.0
N	U S WEST INC	50	43	50.88	-1.4	-2.8
	Computer Systems					
Q	ALLIANT COMPUTER SYS	35	5	6.50	0.3	4.0
Q	ALPHA MICROSYSTEMS	5	3	5.75	-0.4	-6.1
Q	ALTOS COMPUTER SYS	15	5	8.88	-0.8	-8.8
A	AMDAHL CORP	30	16	44.88	2.6	6.2
Q	APOLLO COMPUTER INC	25	5	16.50	-0.1	-0.6
Q	APPLE COMPUTER INC	60	35	38.50	-0.5	-5.0
N	BOLT BERANEK & NEWMAN	25	12	15.88	-0.6	-3.8
Q	BRITTON LEE INC	5	1	2.13	0.0	0.0
N	COMPAQ COMPUTER CORP	79	34	51.50	-2.3	-4.2
Q	COMPUTER AUTOMATION INC	15	5	5.25	-0.8	-8.8
A	COMPUTER CONSOLES INC	11	2	7.13	-0.4	-5.0
Q	CONCURRENT COMP CORP	24	11	16.50	-2.0	-10.8
N	CONTROL DATA CORP DEL	38	18	25.00	-0.8	-3.3
Q	CONVERGENT TECH	6	3	3.31	-0.4	-10.8
Q	CONVEX COMPUTER CORP	20	3	7.88	-0.5	-6.5
N	CRAY RESH INC	119	47	62.13	-4.3	-4.8
Q	DAISY SYS CORP	10	5	6.75	-0.3	-4.8
N	DATA GEN CORP	37	16	21.25	-1.5	-4.8
N	DATAPOINT CORP	5	3	5.38	0.1	2.4
N	DIGITAL EQUIP CORP	200	90	102.38	-4.8	-4.4
Q	FLOATING POINT SYS INC	13	3	3.50	-0.5	-12.5
N	GOULD INC	24	5	14.00	0.8	3.7
N	HARRIS CORP	43	22	28.50	-0.6	-8.5
N	HEWLETT PACKARD CO	74	35	39.75	-1.5	-1.6
N	HONEYWELL INC	81	46	67.38	-2.4	-3.4
N	IBM	175	102	108.75	-4.8	-4.0
Q	INFORMATION INTL INC	15	5	13.00	0.0	0.0
Q	IPL SYS INC	3	1	1.75	0.1	7.7
Q	MASS COMPUTER CORP	14	4	4.25	-0.3	-6.8
N	MATSUSHITA ELEC INDL LTD	228	103	212.00	-11.1	-5.0
Q	MEGADATA CORP	6	3	3.00	-0.1	-4.0
Q	MENTOR GRAPHICS CORP	38	14	28.25	-8.5	-11.7
N	NBI INC	14	4	4.00	0.0	0.0
N	NCR CORP	57	30	38.50	-0.5	-4.8
N	PRIME COMPUTER INC	31	13	16.00	-1.0	-5.9
N	PYRAMID TECHNOLOGY	14	5	12.00	-1.5	-12.7
Q	STRATUS COMPUTER	41	19	26.00	-0.8	-1.5
Q	SUN MICROSYSTEM INC	46	14	34.50	-0.8	-2.1
Q	SYMBOLICS INC	6	1	1.63	-0.1	-7.1
Q	TANDON COMPUTERS INC	37	16	17.75	-0.9	-4.7
N	TANDY CORP	57	36	44.75	0.5	1.1
N	ULTIMATE CORP	37	13	13.13	-1.3	-8.7
N	UNISYS CORP	46	24	22.50	-0.5	-0.6
A	WANG LABS INC	15	10	10.88	-0.1	-1.1
	Software & DP Services					
Q	ADVANCED COMP TECH	5	1	1.25	0.0	0.0
N	AGS COMPUTERS INC	30	11	18.38	0.4	2.1
N	AMERICAN MGMNT SYS INC	20	6	15.25	-0.1	-0.6
Q	AMERICAN SOFTWARE INC	16	6	13.13	-0.8	-5.4
N	ANACOMP INC	11	4	9.38	-0.8	-8.8
Q	ANALYSTS INTL CORP	10	4	6.00	-0.3	-2.0
Q	ASHTON TATE	33	12	25.75	-0.8	-8.5
Q	ASK COMPUTER SYS INC	16	6	12.50	-1.6	-13.0
Q	AUTODESK INC	34	12	38.50	-8.5	-10.8
N	AUTO DATA PROCESSING	38	16	38.75	-1.6	-4.0
N	BOLT, B & BANACK INC	12	5	8.50	-0.5	-2.9
N	COMPUTER ASSOC INTL INC	37	15	28.25	-1.3	-4.7
Q	COMPUTER HORIZONS CORP	15	7	10.75	-0.8	-6.5
N	COMPUTER SCIENCES CORP	73	38	38.88	-4.0	-9.5
N	COMPUTER TASK GROUP INC	17	9	11.13	-0.4	-3.5
Q	COGNOS INC.	17	4	6.63	-0.4	-6.4
Q	COMSHARE INC	38	13	15.25	-1.5	-9.0
N	CULLINET SOFTWARE INC	14	4	7.63	-0.8	-9.2
Q	DUQUESNE SYS INC	35	10	20.00	-1.5	-4.8
A	DATA ARCHITECTS INC	16	7	12.75	0.0	0.0
N	GENERAL MTRS (CLS E)	51	30	43.00	-1.3	-8.8
Q	HOGAN SYS INC	17	4	4.50	0.0	0.0
N	INFORMIX CORP	31	12	20.00	-1.0	-4.8
Q	INTELLICORP INC	11	3	3.00	0.1	4.3
Q	KEANE INC	16	6	11.50	-1.5	-11.5
Q	LOTUS DEV CORP	40	16	22.38	-0.4	-1.5
Q	MANAGEMENT SCI AMER	15	5	6.50	0.1	1.5
Q	MICRO PRO INTL CORP	5	3	2.81	-0.5	-11.8
Q	MICROSOFT CORP	79	37	55.75	-1.4	-2.4
Q	MORINO ASSOCIATES INC	34	7	17	-1.0	-5.7
Q	NATIONAL DATA CORP	34	20	23.75	-1.3	-5.0
Q	ON LINE SOFTWARE INTL INC	23	6	6.00	-0.5	-8.8
Q	ORACLE SYS CORP	19	6	15.75	-1.6	-10.0
N	PANSOPHIC SYS INC	38	11	14.75	-1.4	-8.5
Q	POLICY MGMT SYS CORP	30	15	22.75	-0.9	-4.1
Q	PROGRAMMING & SYS INC	14	7	10.75	-0.8	-6.8
Q	REYNOLDS & REYNOLDS CO	38	14	18.88	1.4	7.8
Q	SEI CORP	16	15	17.25	0.0	0.0
Q	SHARED MED SYS CORP	33	15	22.13	-1.1	-4.8
Q	SAGE SOFTWARE INC.	20	5	9.25	-0.8	-10.7
Q	SOFTWARE PUBG CORP	17	5	16.88	-0.4	-8.8
A	STERLING SOFTWARE INC	12	6	8.88	-0.8	-2.7
Q	SUNGARD DATA SYS INC	21	10	16.50	-1.0	-5.7
Q	SYSTEMATICS INC	33	15	32.38	1.4	4.4
N	SYS. SOFT INC.	24	7	14	-1.3	-8.2
Q	VM SOFTWARE INC	33	7	13.63	-0.4	-2.7
	Semiconductors					
N	ADV MICRO DEVICES INC	25	5	13.88	-0.5	-4.8
N	ANALOG DEVICES INC	34	5	13.63	-0.4	-2.7
Q	ANALOGIC CORP	13	5	6.75	-0.4	-5.8
Q	INTEL CORP	42	16	20.63	-1.0	-5.0
Q	LSI LOGIC CORP	15	7	10.50	-1.3	-10.8
N	MOTOROLA INC	74	35	48.25	-3.3	-4.8
N	NATL SEMICONDUCTOR	22	10	12.50	-0.8	-5.8
N	TEXAS INSTRS INC	60	38	44.75	-3.8	-7.7
A	WESTERN DIGITAL CORP	33	11	15.38	-0.8	-3.9
	Peripherals					
Q	ALLOY COMP.	13	3	3.50	-0.8	-17.5
N	AM INTL INC	5	3	3.75	-0.1	-3.2
N	ASTI RESH INC	21	5	14.00	-0.8	-5.9
Q	AUTO TROL TECH CORP	5	3	6.00	0.0	0.0
Q	BANCTEC INC	16	5	6.00	-0.4	-4.8
Q	CIPHER DATA PRODS INC	14	4	6.75	-0.8	-8.8
A	COGNITRONICS CORP	5	3	3.63	0.0	0.0
N	COMPUGRAPHIC CORP	38	16	28.38	0.1	0.6
A	DATAPRODUCTS CORP	24	7	9.00	-0.1	-1.4
A	DATARAM CORP	5	5	7.50	-0.1	-1.6
N	DECISION INDS CORP	13	4	4.00	0.0	0.0
N	EASTMAN KODAK CO	72	38	40.87	-1.0	-2.4
Q	E M C CORP MASS	29	7	8.88	-0.5	-8.5
Q	EMULEX CORP	6	4	7.88	-0.1	-1.5
Q	EVANS & SUTHERLAND	38	17	17.50	-0.8	-4.8
Q	ICOT CORP	5	3	3.25	-0.3	-7.1
Q	INTERLEAF INC	34	-11	16.50	0.5	3.1
Q	KOMFORT CORP	4	1	2.75	-0.4	-12.0
Q	LEE DATA CORP	8	3	3.25	-0.9	-7.1
Q	MASSTOR SYS CORP	5	1	2.81	-0.4	-11.5
Q	MAXTOR CORP	23	6	14.25	0.5	3.6
Q	MICROPOLIS CORP	44	13	22.75	0.0	0.0
Q	MINISCRIBE CORP	16	6	10.13	-0.8	-8.0
N	MINNESOTA MNG & MFG CO	84	45	58.25	-0.6	-1.1
A	MSI DATA CORP	15	5	15.13	-1.6	-9.7
Q	PERSONAL COMPUTER PRODUCTS INC.	7	4	6.50	0.0	0.0
Q	PRIAM CORP	5	1	1.88	-0.1	-6.3
Q	PRINTRONIX INC	13	7	6.50	0.0	0.0
N	QMS INC	27	8	10.38	-0.6	-4.8
Q	QUANTUM CORP	35	8	10.50	-0.1	-1.2
Q	RAMTEK CORP	6	1	1.50	-0.1	-7.7
N	RECOGNITION EQUIP INC	35	7	7.75	-0.5	-6.5
Q	REXON INC	13	5	7.25	-1.5	-17.5
Q	SCAN TRON CORP	17	7	14.50	-1.5	-9.8
Q	SEAGATE TECHNOLOGY	46	38	16.75	-1.1	-6.8
N	STORAGE TECH CORP	5	1	1.75	-0.1	-5.7
Q	TANDON CORP	7	1	2.31	-0.3	-11.6
A	TEC INC	7	3	4.69	-0.1	-2.9
N	TEKTRONIX INC	41	21	25.75	0.8	3.5
Q	TELEVIDEO SYS INC	3	1	1.25	-0.2	-13.1
N	TELEX CORP	61	30	46.00	-1.5	-3.2
Q	WYSE TECH	40	11	19.25	-0.4	-1.5
N	XEROX CORP	38	50	52.13	-2.3	-4.1
Q	XIDEX CORP	15	5	5.38	-0.6	-10.4
	Leasing Companies					
Q	CAPITAL ASSOCIATES INTERNATIONAL INC	11	4	4.38	-0.3	-5.4
N	COMDISCO INC	37	12	19.38	-1.6	-8.8
N	CONTINENTAL INFO SYS	14	5	5.50	-1.5	-43.1
Q	PHOENIX AMERN INC	6	3	3.00	-0.1	-2.1
Q	SELECTERM INC	6	3	9.00	0.8	17.5

EXCH: N—NEW YORK, A—AMERICAN, Q—NATIONAL O—OVER-THE-COUNTER; 6—SPLIT

Q-7-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

No traction

Interest rates, faltering market trip DEC, Cray, IBM

Slippery footing caused by a generally falling market and rising interest rates caused many computer stocks to tumble in action on Wall Street last week. The biggest decliner among leading computer issues as of Thursday's market close was Digital Equipment Corp., which could not translate an announced technology-sharing agreement with Compaq Computer Corp. into a stock gain. DEC's stock dropped 3⅜ points for the four days of trading and finished at 101½. Compaq was also off; its shares slipped 1½ points to 51⅝.

Other stocks hit last week included Cray Research, Inc., down 3⅝ points to 81¼; NCR Corp., off 2¼ points to 59; IBM, down 1⅜ points to 108¾; Control Data Corp., down 1⅝ points to 24¾; Unisys Corp., down 1⅛ points to 32⅛; Apple Computer, Inc., down 1½ points to 39⅝; and Microsoft Corp., off 1¼ points to 56. But all was not doom and gloom on the Street. Amdahl Corp. benefited from an increased earnings forecast from investment house Dean Witter Reynolds, Inc. to finish up 1⅜ points at 46¼, while Ashton-Tate Corp. closed up ⅝ of a point to to 26¼.

JAMES DALY

Journal

FROM PAGE 1

to the wider realm of information systems in the business world.

Having spent two years working full-time as a programmer/analyst for a bank while attending classes at NYU at night, I left my job in September 1987 and switched to being a full-time MBA student. The advantage of being a full-time student is that I can concentrate on my studies and also take advantage of the recruiting process, which part-time students usually don't get to participate in.

The recruiting process is fiercely competitive. Many of the companies that come to campus are looking to fill only one or two positions, but they interview at least 13 students and sometimes as many as 40 at the GBA, as well as students at other schools. Getting a "callback" to a second interview requires really impressing the recruiter. I try to impress recruiters by researching the firm thoroughly.

I want a job with end-user contact and the ability to manage people and projects. Eventually, I want a project manager's slot, ideally in a financial services firm.

Here's my diary.

JAN 4

The spring semester, and the new recruiting season, began today with the publication of the *Company Schedule Book*, a calendar of recruiters coming to campus. Being an MIS major narrows my choices. At the GBA, most of the students are finance majors, and that is what most of the recruiters are looking for.

I am very focused on the type of position I want. I select nine firms to interview with: two banks, three Big Eight accounting firms, two smaller consulting firms, one computer company and one utility. I feel confident going into this process. My grades are strong — a 3.8 grade-point average — though most recruiters don't seem to care about grades.

JAN 27

Today's my first on-campus interview, and it's with a computer company. They have an excellent professional reputation. However, whether I want to work for them will depend on the location, position and salary they offer.

Wearing my best interview suit, I arrive 15 minutes early, anxious to make a good impression. The recruiter shakes my hand and smiles. I instantly feel comfortable with him. There is no denying the importance of a first impression on both sides. If the interviewer is not pleasant to talk with, I quickly lose interest in working for the company.

The recruiter, because of time constraints, must make a decision based on 30 minutes of interaction. I find that this recruiter has prepared. The questions are mostly related to my work experience and course work.

I don't feel pressured. Since this is my first interview, I admit I am a little nervous walking in. The recruiter shows me an occasional smile, which puts me at ease. His tone of voice makes me sense he is interested in hearing what I have to say.

There are others waiting to be seen. Although I know he is judging me and comparing me to the other students he has seen during the day, he does not emphasize that aspect of the interview. Instead, he seems interested in getting to know me and telling me about his company.

I walk not feeling much more relaxed and confident.

JAN 28

Today is my visit to the utility company. I am annoyed when given an application form to fill out. What tops it off is the question asking whether I can climb poles.

The recruiter is from Personnel, not MIS, and doesn't really know anything about the position I am interviewing for. She asks me questions from a standard interview form, and I don't feel like I have the opportunity to really present my qualifications. She makes no eye contact but rather fires questions at me and writes while I answer them.

The worst part is that almost all the questions are asked from a negative angle. For example, she wants to know what I don't like about my last job, which course at school I am not satisfied with, what I would not like to see on my next job. The interviewer makes it clear from the outset that she is not enjoying the interview. I consider trying to win her over, but I don't really want the job, so I don't bother.

JAN 29

I interviewed at a bank today for a job with the title Account Manager. At first it sounds like I'd be handling loan portfolios. But as the recruiter describes the position, I find myself getting more excited. Had I been asked to describe the position I want, I would have used almost the exact words I am hearing. I would be acting as a liaison between the MIS people developing a new information system and the end users. I would be responsible for defining the requirements and writing up a contract between the two departments.

I want this job badly, and that makes me nervous on the interview. But it gets my adrenaline flowing. I want to convey my enthusiasm without seeming desperate. This recruiter has also gone to NYU's GBA and has a very clear picture of the curriculum, so the questions about school center on his knowledge of the courses.

I emphasize that my experience makes me a good fit for the position and that I am very interested in the job. Apparently I succeed, because I am asked back for a full day of interviews, set for February 19. I tell a friend later that day, "That job has my name on it."

FEB 8

Today I talk to a Big Eight accounting firm. The division I am interviewing with does MIS consulting for financial services, a field that I am especially interested in.

Our discussion revolves mostly around what I've done in the past and what my next job should be. It seems to fit well with the position he is filling. I am impressed with the description he gives of the firm and the position and try to impress him with my qualifications for it.

FEB 12

This first-round bank interview, done at the bank's offices, gives me the advantage of being able to look at the environment and gain a sense of their working styles and the organizational culture. This is an opportunity I usually only get on callbacks.

In fact, although it is a first-round interview, the bank handles it almost like a callback. They have scheduled four people to speak with me, and we all meet for about an hour. The interviewers are all young MBAs, so I feel reasonably comfortable talking to them. In particular, I remember one question: "How do you handle failure?" Good question! Failure is something that MIS managers have to be able to handle.

The job title is Senior Systems Analyst, and the group that I would be joining at this bank numbers only 15. The job focuses on design and documentation of end-user PC applications. I am pleased when they ask me back for a second interview March 1.

FEB 17

It turns out that I made a good impression at the computer company on my first interview. They call me back today to interview for an opening in Danbury, Connecticut. Since I am not interested in moving there, I do not follow up with the second interview. I also receive a letter from the Big Eight accounting firm inviting me for a second round at their offices March 8.

Arnold discusses her qualifications *for an MIS management position with an on-campus recruiter.*

FEB 19

Today is my first callback interview, for the position of Account Manager at the bank. I am scheduled to speak with five people. The first interview is with the person I would be reporting to. I focus less on impressing him — after all, I have been called back — and more on finding out what he is looking for and what the company has to offer.

I find, as the interviewing process unfolds, that in general I am asked very few technical questions. When a technical question does come up, the assumption from the recruiter is that if I don't know the answer, I can probably pick up what I am missing on the job.

The companies I interview with are looking for MBAs. The average starting salaries are in the mid-$40,000 range, and the positions which they want to fill and which I am most interested in are not technical in nature. Rather than specific knowledge of hardware or software, these jobs require the ability to understand a business, to analyze business needs and formulate technical solutions to meet them.

Most important is the need to communicate those solutions to management. Therefore, the recruiters care more about my analytical and communication skills than the particular systems I've worked with in the past. In fact, if a recruiter is especially interested in knowing what programming languages I know, the job is probably more programming-oriented than I care for anyway.

The interviews today seem to go well, but I am not given any indication of whether or not they are seriously interested. They say I will hear from them soon.

MAR 1

Today I go for a callback at the other bank. The position is titled Senior Systems Analyst. I've already been on-site for the first interview and have spoken to four people. This time, I am scheduled for only two interviews: the person in charge of the PC group and the vice-president to whom I'd report.

The main focus this time seems to be on selling me the job, rather than the other way around. Both the people I speak to spend a lot of time telling me about what the group does and its relationship to the rest of the bank. They also emphasize that the job involves a lot of pressure, hard work and long hours.

Since I will not be graduating until the end of the summer, the people who interview me bring up the possibility of my working part-time until graduation.

MAR 8

Today I have a second interview at the Big Eight accounting firm for the Financial Information Systems consulting group.

The first person I speak with is the senior manager I had spoken to on campus. He schedules me to meet with three of his senior consultants and then to have lunch with a recent MBA grad who joined his group in October. He spends most of the half-hour describing the consulting practice and what the available position involves. He then turns me over to the senior consultants, who make it clear that each will focus on a different area of my resume, asking specific questions about what I have done on that job and what I would like to be doing in my next job. I am pleased, since in the past, I have often found myself repeating the same things to everyone.

This is the only interview in which salary is mentioned. It is not considered wise for an interviewee to bring up the question of compensation. However, MBA graduates vary in their backgrounds and previous experience, so there is no "typical" MBA starting salary. The average salary for NYU GBA grads in 1987 was $46,000; MIS majors averaged slightly less. It's a good idea for a company and a prospective employee to have some idea of each other's expectations before extending an offer.

After the first four interviews, I go to lunch with a consultant who joined the firm recently after getting her MBA. The informality of lunch gives

Unix

FROM PAGE 1

"This is a very negative thing," said Gary Handler, vice-president of market decision systems at Shearson Lehman Hutton, Inc. "The Unix industry is poised on the brink of incredible growth. I sincerely hope the vendors can see past this and not destroy what is perhaps the best opportunity they've ever had."

As of late last week, however, all indications were that a rebel action will proceed as planned. IBM spokesmen would confirm nothing. DEC confirmed it has been in discussions with other vendors. HP and Apollo grew increasingly coy. At the end of last week, they were promising big news for this week.

Unix speculation

What the big news will be was the subject of a wide variety of speculation. It is clear that it will be a Unix alternative. One option immediately put forth by industry observers was that the group will turn to the University of California at Berkeley's Unix as a way to be independent of AT&T. But Berkeley's Unix is a derivative whose original license goes back to AT&T.

A second theory put forth was that each member of the group will put in pieces of its own Unix implementations — such as AIX, Ultrix, HP-UX and Domain/OS — to form a sort of merged Unix. But this could prove a time-consuming endeavor, since each vendor would likely promote its own approach.

Paul Cubbage, an analyst at market researcher Dataquest, Inc., suggested that the group will re-engineer the Unix operating system and settle for a Unix look-alike. By week's end, the most commonly heard theory was that the group will set up an independent consortium that will establish the specifications for a Unix-like operating system.

Some sources said the group's efforts will center on IBM's AIX.

All theories seemed to boggle the minds of users and observers alike, since the group itself is composed of competitors. With the exception of IBM, the companies belonged to the so-called Hamilton Group, an unofficial team of vendors that confronted AT&T earlier this year and expressed concerns that it was ruining Unix's chances of being a truly open operating system.

The Hamilton Group complaints centered on two major issues: AT&T's alliance with Sun Microsystems, Inc., which they claimed would give a top competitor unfair access to future Unix releases, and the AT&T licensing policies, which they claimed are becoming more restrictive.

AT&T met with Hamilton Group members collectively and individually during the winter. However, most members said they were unhappy with the results and publicly expressed concern that AT&T was not being as cooperative as they would like. Privately, according to industry observers, the group then set plans in motion to free itself from AT&T's control. To do so, they would need to establish their own alternative.

"If they are just approaching it as a closed group that's got yet another version, then they won't go anywhere," said Robert Borochoff, a senior research computer scientist at the Federal Judiciary Center in Washington, D.C. "They'll be compared with Unix and viewed as a proprietary operating system."

Chicago fire

FROM PAGE 1

machines in Chicago, served by suburban DP centers, went blank, as did scores of Illinois Lottery terminals.

O'Hare Airport suffered a temporary loss of flight information sent from a west suburban Federal Aviation Administration (FAA) tracking station over 28 data circuits. "We had to slow things down," FAA spokesman Mort Edelstein said. "We had to separate all planes by 20 miles, instead of three miles, just for safety." O'Hare's radar scopes, be added, never went black, and the FAA switched to 16 backup lines within hours.

BRIAN BART PHOTOGRAPHY

A salvage worker *sorts through the switching station rubble.*

Telephone on wheels

Some businesses in the 30-mile-wide area served by the damaged switching hub had to resort to cellular phones to get their business done. "One of our vendors called us from her car phone," said Tim O'Neill, a computer operations supervisor at Unocal Corp.'s Refining and Marketing Division in Schaumburg, Ill. "She could call us, but we couldn't call her."

Unocal was able to switch faulty phone lines to the company's national private network, which is powered by microwave links. But other firms faced the grim prospect of shutting down suburban operations.

Sears, Roebuck & Co.'s telemarketing division in Downers Grove, Ill., sent dozens of phone sales personnel home on indefinite leave, according to Sears spokesman Gordon Jones.

Flower outage

Some operations were paralyzed by the phone shutdown. "Right now, we're totally out of business," said Dennis Blondell, assistant director of operations at the Floral Network, Inc., a subsidiary of the Floral Transworld Delivery Association of Florists, late Thursday evening.

Blondell said the outage, which hit on Mother's Day, stopped all phone traffic and halted the computer system that connects 12,000 of the association's 23,000 florists.

Blondell, among others who suffered with the phone blackout last week, wondered how a single fire was able to knock out so much of Illinois Bell's network. The answer, according to Illinois Bell Vice-President of Operations James Eibel, is that the system only has 25% redundancy at gateways like Hinsdale. Chicago hubs, in contrast, have 50% redundancy.

The Hinsdale switching center, located just off the small village's main street, was unattended when fire broke out at about 4:00 p.m. As a matter of policy, the alarm did not ring through to the local fire department. According to Illinois Bell spokesman Tim Bannon, the company feared that without guidance from Illinois Bell technicians, local firemen would damage sensitive phone equipment with sprayed water.

Aftermath

Last week, a task force of 150, including disaster specialists from Northern Telecom, Inc., AT&T and Bell Communications Research Corp. (Bellcore), worked to remove humidity in the building that was combining with soot to form corrosive acid.

At first, the team tried to salvage the local phone switch, a 1970s-vintage analog 1A ESS. "Replacing the components is a trivial problem," scoffed one Bellcore adviser on the scene. "But replacing the 40,000 circuit connections is a long and tedious chore. What we had here was a complete disaster."

Late last week — after a failed effort to link trunk lines to temporary microwave dishes atop the Hinsdale center — the company abandoned the idea of salvaging the frames. Instead, they will be replaced with a new, fully digital switch during the next two to four weeks. Long-distance service was expected to resume this week, with the replacement of 60 Northern Telecom bays of multiplexing equipment that route long-distance toll calls over fiber-optic lines.

Meanwhile, Floral Network said it plans to erect a satellite dish to bypass the local switching office in the event of another phone line emergency.

me a chance to ask some questions I might have hesitated to bring up in a more formal setting.

MAR 17

Today I receive a letter from the first bank stating that they are not interested in hiring me. I am very disappointed — the job seemed a perfect fit — but I am learning not to take rejections personally.

But the second bank is very interested in hiring me. We enter the negotiation process.

My feeling that I impressed the Big Eight firm is confirmed when I receive a written offer for a job. Now things are looking better.

MAR 24

What to do? Accept the bank's offer, the Big Eight firm's or return to my former employer, who is anxious to have me back? The deciding factors:

1. The position. I am anxious to be in a job where I will have the opportunity to learn about the business. I like to code, but I don't want to be a programmer. The ideal position would include a lot of people contact and very little machine contact.

2. The corporate culture. I am the type of person who thrives on pressure, so the prospect of difficult work does not turn me off. Although I am willing to work hard, I need a friendly atmosphere and a degree of recognition.

3. The manager. The managers I have worked with most effectively were competent and well-informed. They were around when I needed them but allowed me the freedom to work without interference. Most importantly, they were willing to listen to my ideas and suggestions and encouraged me to be creative. This is what I am seeking in a boss.

4. Job title and compensation. I have worked very hard on my MBA, and I believe it adds significantly to my value as an employee. The advantage of an MBA in MIS vs. a graduate degree in computer science is the combination of technical awareness with general management and business skills. My title and compensation should adequately reflect my value to the company.

Even if I don't land a dream job, recruiting has been worthwhile as an experience. It gave me a chance to see what is out there and to gain confidence in the hunt. The toughest task remains: I must now make a decision.

Postscript: For Vivienne Arnold, it was a busy spring. She finished the semester, got married in April and in early May decided to join a large New York bank as a senior systems analyst.

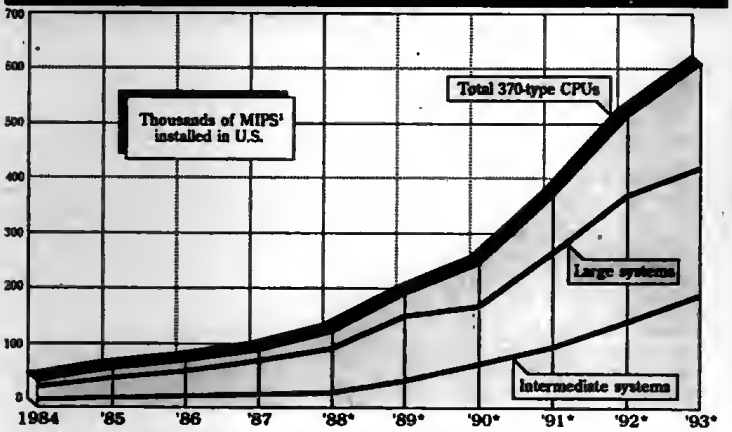
Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, except: (6) issues in February, May, August and October, (5) issues in January, March, April, June, July, September and November and (4) issues in December with a single combined issue for the last week in December and the first week in January of 1989 by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1988 by CW Publishing/Inc. All rights reserved.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: write to Circulation Dept. for subscription information.
Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.
Permission to photocopy does not extend to contributed articles followed by this symbol. ‡
Special requests for reprints and permission should be addressed to Nancy M. Shannon, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 255-5366 or in New Jersey call (800) 322-8286.
Requests for missing issues will be honored only if received within 60 days of issue date. Back issues, if available, are charged at $2.00 per issue, plus postage.
Subscription rates: $2.00 a copy; U.S. — $44 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year; all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, Circulation Department, P.O. Box 1566, Neptune, NJ 07754-1566.

TRENDS

IBM mainframe growth

Overall, users will devour five times more MIPS in five years



[1] Millions of instructions per second
*Projected

The boom in personal computers and local-area networks is continuing the erosion of mainframe computing that was begun by minicomputers, according to many experts.

But that does not spell doom for mainframes, judging by a recent study by Annex Research in Phoenix. In fact, the report shows that mainframe MIPS are approaching the start of a five-year growth spurt.

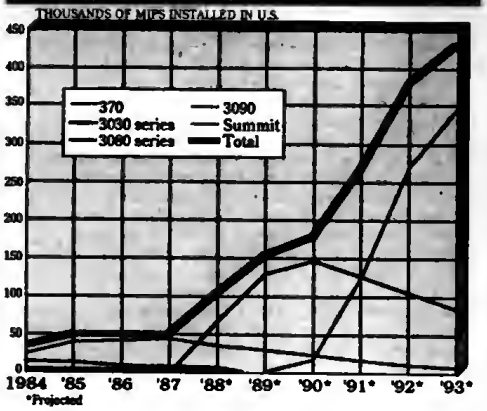
Although the number of millions of instructions per second (MIPS) running on mainframes will increase, the number of mainframes will diminish as more processing power is crammed into a box. Such has been the trend since the mid-1970s, said Bob Djurdjevic, president of Annex Research.

"Multiprocessing contributes to this trend," Djurdjevic said, explaining that putting more than one CPU into one box increases computing power and the number of applications that can be processed but does not increase the population of mainframes. "High-end MIPS growth had been in the single digits. It will increase to a double-digit growth rate," he said.

Although IBM's Summit series, which is expected in late 1989, will contribute to mainframe growth, Djurdjevic said, "I'm not particularly bullish about Summit, but about the mainframe market in general."

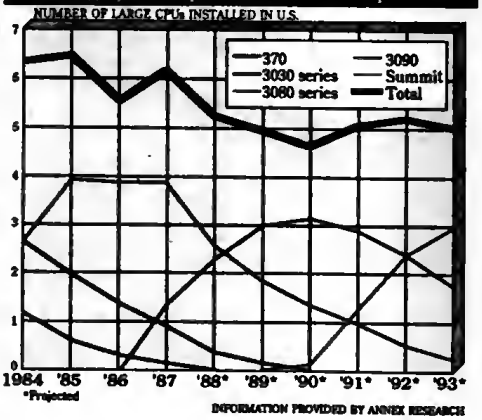
STANLEY GIBSON

MIPS growth on big CPUs will be faster



*Projected

But big system purchases will taper off



*Projected

INFORMATION PROVIDED BY ANNEX RESEARCH

INSIDE LINES

Whaddaya gonna do with all those MIPS? Alliant Computer Systems will unveil a high-end parallel processing minisupercomputer today that will double the performance of Alliant's FX/80, currently the vendor's most powerful system, according to a source close to the company. Dubbed the FX/82, the processor will provide 378M floating-point operations per second at peak performance and 235 million instructions per second, running the Whetstone benchmark. The 16-processor system, a cluster of two eight-processor FX/80s, will run current Alliant applications, carry a price tag of about $1.25 million and ship this quarter, a source said.

Granted, that's a lot of money. Sematech, the semiconductor manufacturing research consortium in Austin, Texas, passed another milestone last week when it signed an agreement with the U.S. government that releases a $100 million federal grant. The agreement makes the Defense Advanced Research Projects Agency (DARPA) a regular member of the consortium, giving it access to the tools and techniques developed at the Austin center. DARPA may then pass the research on to defense contractors.

Get the Pepto-Bismol. For some users, Friday the 13th may have been a nightmare on Elm Street. A triggering mechanism on the Jerusalem personal computer virus, which has been spreading across the country, was set to go off on Friday. When triggered, the virus scrambles the index to the hard disk.

A burner for Turner. Big league data processing is finally catching up with media mogul Ted Turner. For years, Turner's Atlanta-based operations have relied on a Basic Four system for its corporate computing. This summer, however, Turner is moving the processing for his Turner Broadcasting, Turner Entertainment and Cable News Network operations onto an IBM 4381. Meanwhile, CNN's roving reporters just received Datavue Spark laptops to file scripts and stories from such global hot spots as the Gaza Strip and the Persian Gulf. Who says glamour is dead?

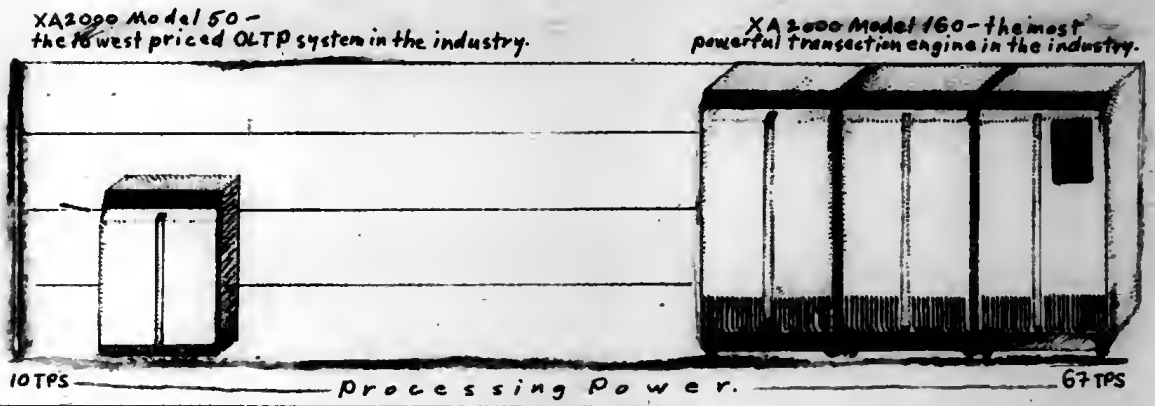
"I'm in charge here." When Econocom-USA Chairman Ken Bouldin officially takes over as president of the Computer Dealers and Lessors Association June 1, he will be uniquely qualified to whip the troops into shape. At a ceremony in Memphis next Saturday, Bouldin will be recognized for his promotion to brigadier general in the U.S. Army Reserve. Dress blues and whites or mess blues and whites are required for military personnel attending.

OS/2 Extended Extended: While Microsoft has rallied for support of its OS/2 LAN Manager, IBM has been quietly signing people up to support its proprietary OS/2 Extended Edition. While it was not exactly a watershed, nine vendors announced products that require the IBM-specific operating systems. A quick check, however, revealed that at least one vendor, Micrografx, mistook Extended Edition to mean OS/2 with the Presentation Manager, not OS/2 with a proprietary IBM data base and communications capability. None of the industry biggies pledged to write for the operating system that is set to ship this summer.

OK, I'll take the bridesmaid. Behind the happy faces at last week's unveiling of a joint networking design and support venture between Hewlett-Packard and Northern Telecom lurked the shadow of DEC. HP wasn't exactly Northern Telecom's first choice, according to one source. He reports that the private branch exchange maker "worked real hard to do this with DEC" but was not able to reach an agreement.

Your (pink) slip is showing. With its fiscal year ending in two weeks, On-line Software International has invoked a little belt-tightening. The company recently laid off about 4% of its 850-member worldwide work force as it attempts to get expenses in line with the zero-based budget planned for fiscal 1989. The layoffs, which cut across the company, were aimed specifically at reducing head counts in support areas bloated by the firm's acquisitions over the last few years.

Stratus holds the bottom line all the way to the top.



Stratus delivers the lowest cost per transaction all along the line.

At Stratus, we take great pride in our unfailing ability to deliver the right amount of power for any on-line transaction processing job – at the right cost.

LOWEST ENTRY COST.

For starters, our XA™2000 Models 50 and 70 aren't just low priced Stratus systems; beginning at $79,000, they're the lowest-priced complete OLTP systems on the market.

And they're Stratus quality through and through, incorporating the single-system architecture found throughout the Stratus line that gives you high-performance OLTP, the best fault tolerance and modular expandability for easy growth.

LOWEST COST PER TRANSACTION.

Stratus price/performance numbers are consistently better than other systems. For good reason. Designed specifically for OLTP, Stratus systems are equipped with multiprocessor technology that's not only powerful, but exceptionally efficient and economical.

In fact, from our low end systems right up to the powerful Model 160 that handles more transactions per second than any other computer you can buy, each and every Stratus delivers the lowest cost per transaction in the industry.

HIGHEST CUSTOMER LOYALTY.

Factor in our transparent fault tolerance, ingenious communications features, unparalleled connectivity, and comprehensive Remote Service Network, and you start to see why Stratus commands the highest customer loyalty in the computer industry.

And why so many major firms worldwide in financial services, brokerage, manufacturing, retailing and telecommunications rely on Stratus technology to build global OLTP networks. For more information, call Stratus today at 617-460-2192.

The XA2000 family of on-line transaction processing systems.

Stratus®

The OLTP Solution.

AFTER A THOROUGH EXAMINATION, JEWISH HOSPITAL CHOSE MSA.

Some of the finest physicians in the Midwest practice at Jewish Hospital in St. Louis. It's an excellent hospital with an excellent reputation. But it *is* a business, and recently due to a desire for better information access and control, Jewish Hospital found a need to convert from a shared computer system to a private one.

So after very careful consideration, Jewish Hospital converted to Financial, Human Resource and Materials Management software systems from Management Science America, Inc.

"Initially we looked at 15 software companies," said John McGuire, executive vice president of the hospital. "In making our evaluation, we considered solicitations and talked with the users of various systems. We then considered five finalists who gave presentations. Then we narrowed our choice down to two, and ultimately went with MSA."

Why MSA over all the other software companies?

"User satisfaction with their products," was one of the reasons McGuire cited. "Also, MSA's customer service reputation was very good. We feel we made the right choice by going with MSA."

Now that MSA and Jewish Hospital are working together, the hospital is integrating its operational and financial information. According to McGuire, "MSA is helping us take better care of the business side of our hospital...and that lets us take better care of our patients."

If you would like to know more about what we're doing for Jewish Hospital, or what we can do for your business, contact Robert Carpenter in Atlanta at (404) 239-2000.

MSA The Software Company

©1987 Management Science America, Inc.